Steca

www.stecasolar.com

PV GRID CONNECTED

PV OFF GRID

SOLAR THERMAL

Solar electronics

Current Automation

Product Catalog
2008|2009

english

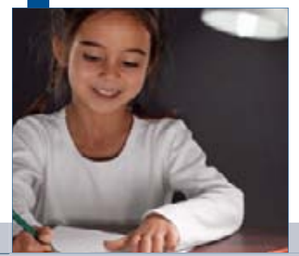
16 Staal Street, Kya Sand, Randburg, 2162, Gauteng
P O Box 2051, Northriding, 2162
E-mail: ettienne@switches.co.za, Web: www.rectifier.co.za
Tel: +27-11-462-4253, Fax: +27-11-462-4310

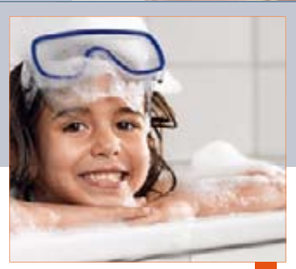
Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com

www.stecasolar.com

PV GRID CONNECTED

PV OFF GRID





SOLAR THERMAL

STECA – THE COMPANY

Disclaimer

Steca Elektronik GmbH reserves the right to add, modify or discontinue products which are shown in the catalogue. Please return to Steca if you need further and updated product information. The information contained in this catalogue is not comprehensive. Despite our efforts, it may not be accurate, up to date or applicable to the circumstances of any particular case. We cannot accept any liability for any inaccuracies or omissions in this catalogue.

Steca is a protected trademark of Steca Elektronik GmbH, Germany, registered by the International Bureau of the World Intellectual. You may not use this trademark without our express permission. Your use of this catalogue and the operation of these terms and conditions shall be governed in accordance with the laws of the Federal Republic of Germany.

Content

PV GRID CONNECTED 4-17

Grid Connected Inverter: Technology 6
StecaGrid 300/500, StecaGrid Control StecaGrid Remote 8
StecaGrid 2000+ 10
StecaGrid Connect: User Software for Remote Monitoring 13
StecaGrid Configurator 13
Connection examples for DC disconnect 14
Service Information 16
Product Overview 17

PV OFF GRID 18-63

Solar Home Systems 20
Night Light Systems 22
Steca's Charging Technology 24

Solar Charge Controller:
Steca PR 0303, PR 0505 26
Steca Solsum 5.0c, 8.0c, 6.6c, 8.8c, 10.10c 27
Steca PR 1010, 1515, 2020, 3030 28
Steca 2020-IP (Version IP 65) 29
Steca Solarix Alpha, Gamma, Sigma, Omega 30
Steca Solarix PRS 31
Steca PR 0606N, PR 1010N Night 32
Steca Solarix 2401, 4401 33
Steca Tarom 235, 245, 440 34
Steca Power Tarom 2070, 2140, 4055, 4110, 4140 35

Accessories:
Steca PA Tarcom Data Logger 36
Steca PA HS200 Shunt 37
Steca PA 15 Remote Control 38
Steca PA EV 200 DC Relay 38
Steca Solsum VC Voltage Converter 39
MDC/MDCI DC-DC Voltage Converter 40

Energy Saving Lamps:
Steca Solsum ESL 5 W, 7 W, 11 W/12 V Energy Saving Lamps 41

Solar freezer:
Steca PF 166 42

Fuel Cells:
Steca fuel cells Efoy 600, 1200, 1600 43

PV Battery Systems 44

Hybrid System 46
General Recommendations 50

Steca Solsafe 52

Inverter Selection Matrix 51

Sine Wave Inverter:
Steca Solarix PI 550 W - 2,200 W 54
Steca Solarix Sinus 550 I, 550 RI, 900 I, 900 RI 57
Steca AJ 58
Steca XPC 59
Steca Compact 60
Steca HPC 61
Xtender XTH 3,000 W - 8,000 W 62

SOLAR THERMAL 64-93

Solar Thermal Systems: Technology 66-67

Temperature Differential Controller:
Steca TR 0201 68
Steca TR 0301 69
Steca TR 0301 U 70
Steca TR 0301sc 71
Steca Sundra 72
Steca Suntana 73
Steca Suntana 2 74
Steca TR 0502 76
Steca TR 0603 78
Steca TR 0603mc 80
Steca TR 0704 82
Steca TA 0403 84

Solar Stations:
Steca TPS 20 86
Steca TPS 25 88

Accessories:
Steca TA VM1 90
Steca TA VM2 91
Steca TA ES1 92
Steca TA OP1 92

Temperature sensors:
Steca Pt 1000 93
Steca Pt 1000-RAF 93
Steca Pt 1000-MWT 93

STECA – THE COMPANY 94-103
Solar electronics – made by Steca 96
30 years of Steca Electronics 98
Steca – The EMS provider 100
Service about the theme electronic 102
Regional and international 104

Symbol-Legend 106

Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com

Power from the sun...

... for everyday use

In one hour, the amount of energy radiated to the earth by the sun exceeds the annual energy requirement of the world population. Making use of this inexhaustible energy source for our everyday electricity requirement is the great challenge of the present and the future.

Steca was quick to recognise the potential of solar energy: The company has become synonymous all over the world with vision, innovation, and initiative in the name of solar power. Steca is a recognised specialist in the development of high-performance systems which turn light into electricity before feeding it into the public grid. To achieve this, Steca has developed modular components which offer made-to-measure solutions for the widest range of household sizes and demands. Whether being used in a small solar power system for a single-family house or an elaborate combined solution for an industrial complex, Steca grid-feed inverters all have one thing in common: They offer the highest performance along with maximum flexibility and ease of use.

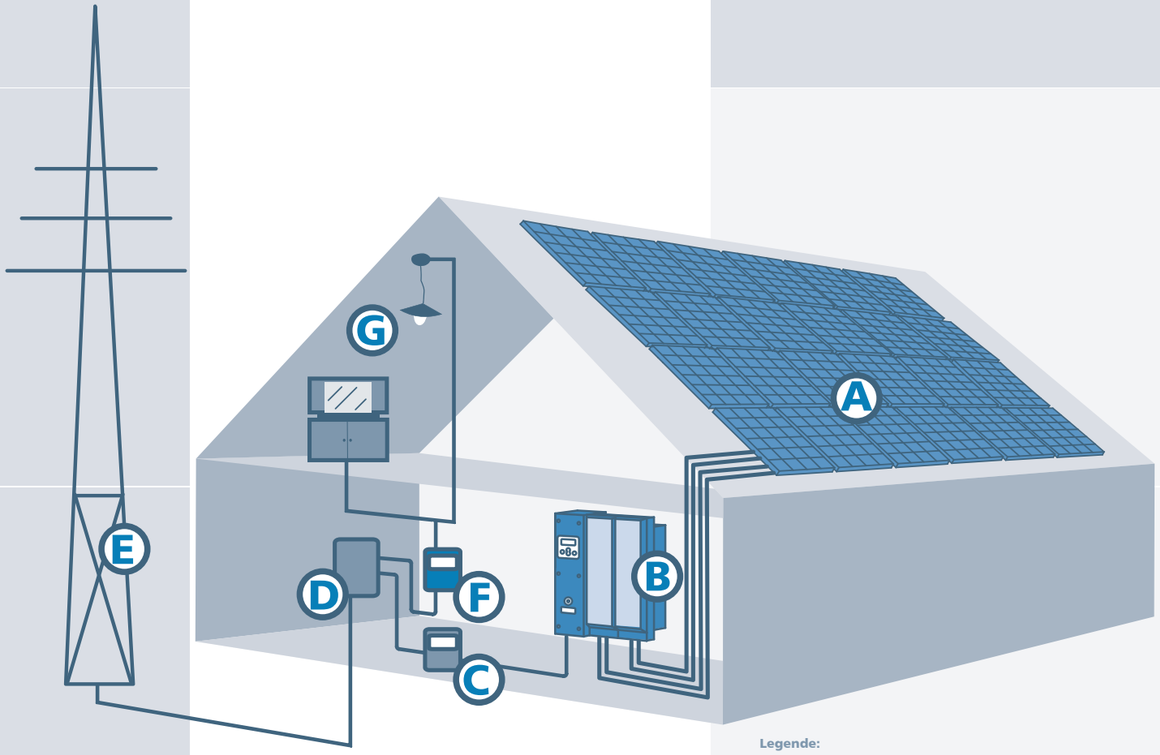
PV GRID CONNECTED

MiniString-Inverter for small solar systems

Communication unit for MiniString-Inverter

Steca DualString-Inverter for solar systems from 2,000 W

Communication unit for DualString-Inverter



Legende:

A Generator
B Inverter
C Electricity meter for injection
D House connection point
E Public electricity network
F Electricity meter for consumption
G Consumer load

Inverters for grid connection

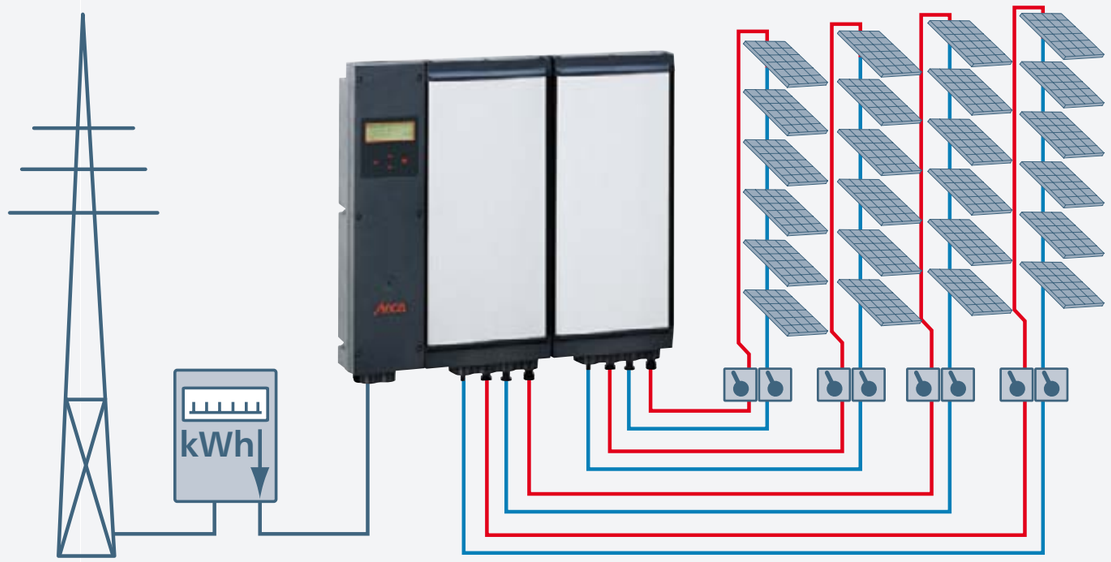
Together with their range of accessories, the StecaGrid inverters represent an innovative family of inverter solutions for grid-connected solar power systems. With a combination of the highest possible performance, ease of use and maximum flexibility, Steca offers a range of modular components that you can combine to suit your requirements – solutions from 300 W to several 10,000 W.

This combination of an enormous range of system sizes, a modular concept and a wide range of accessories offers you over 100 different possibilities for designing an inverter system tailored to your individual needs.

Maximum flexibility for maximum results.

Example for configuration of a 4,4 kWp system:

Module type:	185 Wp (U_{mpp} = 36,0 V; I_{mpp} = 5,1 A)
Module quantity:	24
Inverter:	StecaGrid 2000+
Number of inverters:	1 Master, 1 Slave
Number of MPP trackers:	4
Modules per inverter:	2 x 6
Installed nominal power:	4,4 kWp (DC)



StecaGrid 300/500

The StecaGrid 300/500 inverters were developed to make the use of solar energy as simple as possible. They are simple to install, easy to expand, and can be optimally adjusted to suit the local irradiation conditions.

The StecaGrid 300/500 is perfectly suited to smaller solar systems between 300 W and 3,600 W. The StecaGrid MiniString inverter series comprises the StecaGrid 300 and StecaGrid 500 inverters. The devices are rated at 300 W and 500 W, but can be expanded and combined with each other. Together, they form a system composed of two or more module strings (referred to as multi-string system). System sizes of 300 W to 3,600 W are possible. StecaGrid MiniString inverters have an independent MPP tracker and achieve a very high efficiency of up to 95.8 %. The modularity of the system makes the inverters suitable for smaller systems and/or systems on partially shadowed roofs.

Features

- Flexible and expandable
- Efficiency of up to 95.8 %
- MiniString concept
- Low weight
- Simple installation
- One StecaGrid Control per system is sufficient

StecaGrid Control

The StecaGrid Control monitors the performance of the system. It shows the generated kWh and the status of the system and has (optional) safety features (EHS in Germany).

StecaGrid Remote

In addition to the StecaGrid Control an external wireless communications unit is available: the StecaGrid Remote.

It shows the current output, the system status and the amount of energy generated on a daily, weekly, monthly and yearly basis.

Modular and flexible

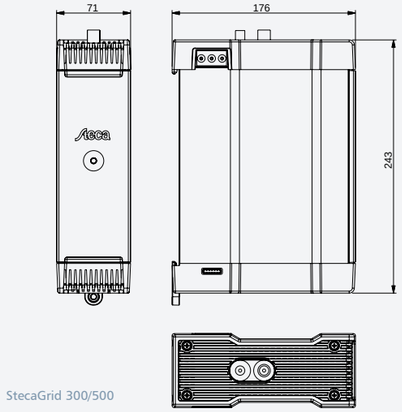
The StecaGrid 300/500 product range is built in a modular manner, is simple to install and easy to adapt to your requirements. In a three-phase-system it can be expanded infinitely at any time and can thus flexibly adapt to your solar system investment.

Technical data

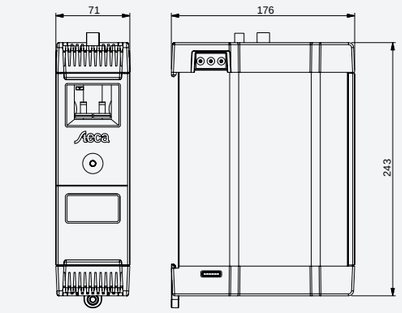
	StecaGrid 300	StecaGrid 500
Input DC		
Input voltage range	45 V – 135 V	45 V – 230 V
MPPT range	45 V – 100 V	75 V – 170 V
Max. recommended PV power	100 V	170 V
Max. input rating	320 W *	530 W *
Max. input current	5 A *	
DC connectors	Multi-Contact MC 3 (Solarline 1) or Tyco Solarlok	
** Greater available input power and/or higher available current are not utilised as the inverter contains a protection against overload.*		
Output AC		
Nominal output rating	300 W	500 W
Nominal voltage	230 V	
Engine type	L/N + PE, single phase	
Commercial frequency	50 Hz	
Max. efficiency	94.8 %	95.8 %
European efficiency	93.4 %	94.5 %
Power-derating at full-power	from 45 °C ambient temperature	
Self consumption of the inverter	0 W	
AC connectors	Wieland Electric GST 18i3V	
General		
Galvanic separation	none	
Internal power supply	supplied by solar panel (no Standby power)	
Weight	1.4 kg	
Ambient temperature domain	-20 °C to 45 °C	
Enclosure type	IP 20 (interior)	
Dimensions (h x d x w)	243 x 176 x 71 mm	
Norms and certifications		
Certification	KEMA, CE	

	StecaGrid Control N	StecaGrid Control D
Earth leakage circuit breaker	30 mA AC; **	
Main isolator switch	yes	
Visualisation	Display	
Weight	1.75 kg	
Self consumption	2.4 W	
MSD	without MSD	according to DIN VDE 0126
Dimensions (h x d x w)	243 x 176 x 71 mm	
***) DC sensivity is suitable for StecaGrid 300/500.*		
Norms and certifications		
Certification	CE	

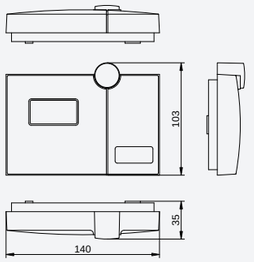
	StecaGrid Remote
Display	from StecaGrid Control
Transceiver	868 MHz ISM
Power supply	2x LR06 (AA) batteries
Dimensions (h x d x w)	103 x 35 x 140 mm
Norms and certifications	
Certification	CE



StecaGrid 300/500



StecaGrid Control



StecaGrid Remote

StecaGrid 2000+ Master

StecaGrid 2000+ Slave

StecaGrid 2000+
2,000 W up to several 10,000 W

Photovoltaic modules generate power from solar energy in an environmentally-friendly manner. The basis for the development of the StecaGrid 2000+ inverters was to allow this solar energy to be flexibly used in a versatile manner and feed it into the public grid.

The StecaGrid 2000+ is perfectly suited to solar systems from 2,000 W upwards. Systems between 2,000 W and 6,000 W are implemented with a single device, systems above 6,000 W can be implemented using several devices in a master-slave combination.

The StecaGrid 2000+ uses the DualString concept. Every inverter has two inputs. One module string can be connected to each input. If necessary both inputs can be connected in parallel. Several combinations of strings and inverters are connected to the public grid. The advantage of such a system is the low sensitivity to negative influences such as (e.g.) partial shadowing, functional faults, or the dropout of a string. The use of several decentralized master-slave combinations reduces the cost of DC cabling and minimizes electrical losses.

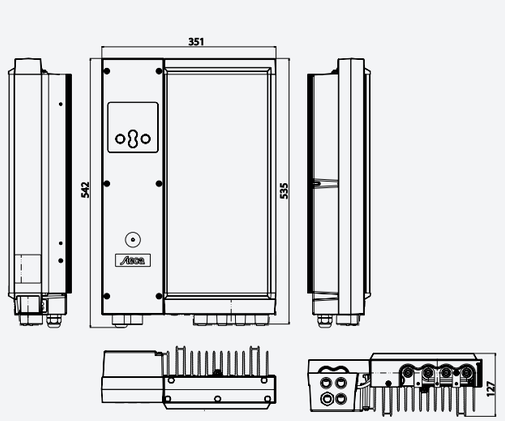
Features

- DualString concept (2 MPP-Tracker per device)
- Flexible and expandable
- Master-Slave concept
- Suitable for outdoor installation (IP 65)
- Fanless and maintenance-free
- Efficiency of up to 95.0 %
- Informative display
- Low weight
- Simple installation
- Integrated Data logger

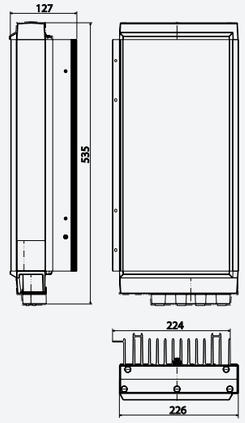
StecaGrid 2000+ and 2 Slaves

Technical data

	StecaGrid 2000+ D StecaGrid 2000+ Master	StecaGrid 2000+ Slave
Input (PV-side)		
Input voltage operating range	80 V to 450 V	
MPPT-range	80 V to 400 V	
Max. startup input voltage	410 V	
Max. dc input power	1075 W [per input] or 2150 W [2 inputs in parallel]	
Max. Input current	2 x 8 A [current limited by inverter] oder 1 x 16 A [parallel connected input]	
DC connectors	MultiContact MC 4 (Solarline 2)	
Output (Grid-side)		
Nominal output voltage	2,000 W	
Mains voltage	190 bis 265 V [depending on country selection]	
Grid type	L/N + PE, single phase	
Mains frequency	47.5 bis 52 Hz [depending on country selection]	
Max. efficiency	95.0 %	
European efficiency	93.3 %	93.5 %
Power derating at full load	beginning at 40 °C (Tamp.)	
Self consumption of the inverter (Night operation)	1.3 W (with ENS) 1.0 W (without ENS)	none
AC connectors	WAGO 2.5 - 6 mm²	–
General		
Galvanic separation	HF-Transformer with galvanic seperation	
Dimensions (h x d* x w) * incl. wale mounting bracket	542 x 140* x 351 mm	535 x 140* x 226 mm
Weight	11 kg	9 kg
Ambient temperature domain	-25 °C to +60 °C	
Enclosure type	IP 65	IP 65
Humidity	0 % to 95 %	
Noise level	< 32 dBA	
Norms and certifications		
Certification	CE	
Others		
Visualisation	Display, LED	via Master



StecaGrid 2000+ Master



StecaGrid 2000/2000+ Slave

StecaGrid 2000+

Flexible and versatile

The modular concept allows you to quickly and easily mount a solar system that suits your needs. One StecaGrid Master can be interconnected with two further StecaGrid Slaves. This allows a single device to cover an output range from 2,000 W to 6,000 W. Addition of further inverters allows solar systems of several 10,000 W to be implemented.

Adaptable

Whether a small house, a large apartment building, a farm or a freestanding system, the StecaGrid inverters can be used in a wide range of applications.

Steca 2000+ inverters can be combined to each power ranges of over 100 kW.

PC-network interface

StecaGrid Connect

For "on-site" system configuration and monitoring, the StecaGrid Master products are delivered as standard with a data recording display. Steca offers a PC/network interface for communication with a PC: StecaGrid Connect.

StecaGrid Connect provides an Internet browser (via ethernet interface) that allows you to access current performance and yield data using Internet Explorer. The feature-rich StecaGrid Connect software is available in an end-customer/solar system version and a solar installer version. The StecaGrid Connect software for end-customers/solar systems allows monitoring of a solar system using a PC. The solar installer version of the StecaGrid Connect software allows remote operation, maintenance, fault diagnosis and changing of operational settings by installers.

StecaGrid Connect-User

Software for remote monitoring

The economic viability of the solar system is determined by the daily energy yields of the solar system from solar energy. StecaGrid inverters allow these values to be accessed and analyzed at any time. These features allow complete, integrated monitoring of the solar power system.

Datalogging

In order to provide an easy overview of the system functions, voltage, current, module output, grid frequency and grid voltage, among other values, are measured within the inverter. The energy yields of both the master and slave units are also stored on a daily, monthly and yearly basis.

These measurements and the operating modes of the StecaGrid system can be read on the user-friendly display.

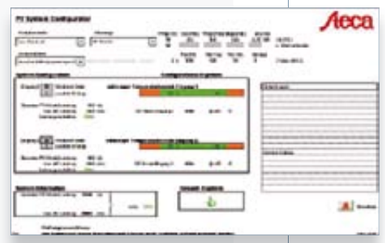
Data communication

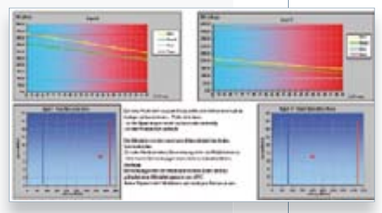
Using the optional StecaGrid Connect software and a network interface card, you can also download the StecaGrid system data and process it on a PC. This allows the stored data to be not just read but also transferred to your own PC in a structured form and then evaluated in any manner you wish. Naturally, this program also provides a preconfigured graphical display of the values. The appropriate software – provided for free of course – is available in end-user and installer versions. On the one hand, this difference protects the end user from intentional and unintentional manipulation of their own system. On the other hand, the installer has the possibility of quickly and exactly making any necessary changes without needing to be on-site. This guarantees a seamless and timely service.

Monitoring

If the inverter is connected to a permanent Internet connection, then the data can be accessed via a web browser or the StecaGrid Connect software from any location using the StecaGrid Connect and a corresponding password. This allows the system to be monitored at any time, from anywhere in the world. Naturally, you can also use this possibility to present your PV system and provide impressive demonstrations of its functionality and yields. This is made possible by the provision of special HTML pages. These show all the stored inverter values. Both the current performance, and yields over a specified period of time, can be quickly and flexibly accessed. To guarantee a high level of security, access to these personal HTML pages is of course password-protected.

StecaGrid Configurator





The StecaGrid Configurator is designed to dimension a grid-connected photovoltaic system.

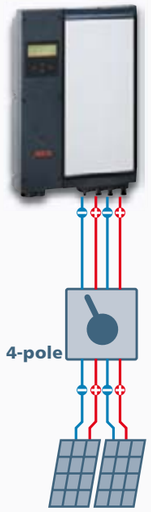
It has been conceived to simulate the combination of the StecaGrid inverter series with all available solar modules and to realise an optimised configuration. User-friendly graphics and remarks contribute to visualise the results very articulate.

The realisation of the StecaGrid Configurator as an Excel-sheet increases conformity and simplifies handling. Additionally, time-consuming software-installations on the PC can be avoided. As a large quantity of technical data and information is already present in the internal data base, the user can realise lots of different scenarios by entering only very few values. On the other hand, you can also assess very special and personalised constellations by entering your own data. Of course, all this can be done in your native language as this tool offers a various choice of languages.

Connection examples for DC disconnect

Independent inputs (2 MPP trackers)

Master

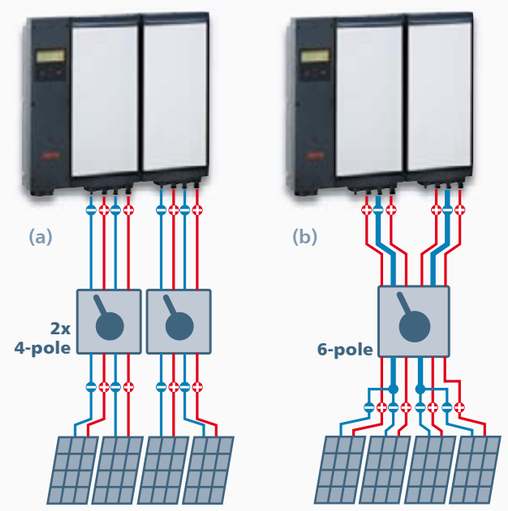


2 MPP-optimised module strings*

2 module strings are connected to the two inputs of a master. Each string is controlled via its own MPP tracker for optimum yield.

The 4-pin switch is installed near the inverter as a DC disconnect.

Master + Slave

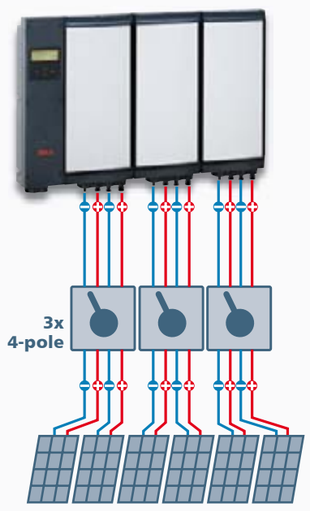


4 MPP-optimised module strings*

2 module strings are connected to the four inputs of a master/slave system. Each string is controlled via its own MPP tracker for optimum yield.

In variant (a) the DC disconnect is made up of two switches; in variant (b) there is just one switch.

Master + Slave + Slave

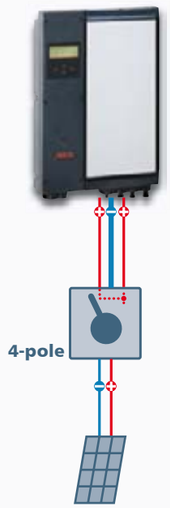


6 MPP-optimised module strings*

6 module strings are connected to the six inputs of a master/slave/slave system. Each string is controlled via its own MPP tracker for optimum yield.

Each inverter has its own DC disconnect.

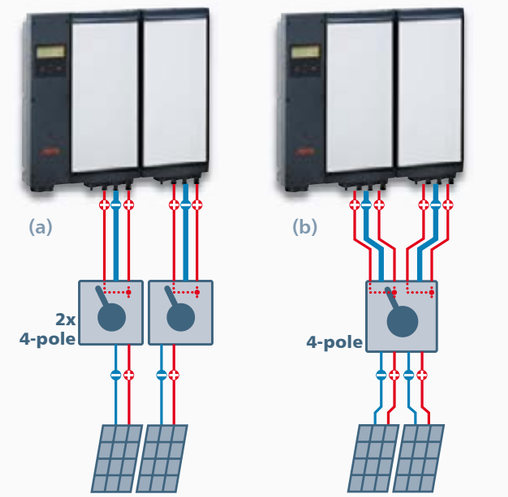
Parallel inputs (1 MPP tracker)



1 MPP-optimised module string*

1 module string is connected to the parallel-connected inputs of a master and controlled via an MPP tracker for optimum yield.

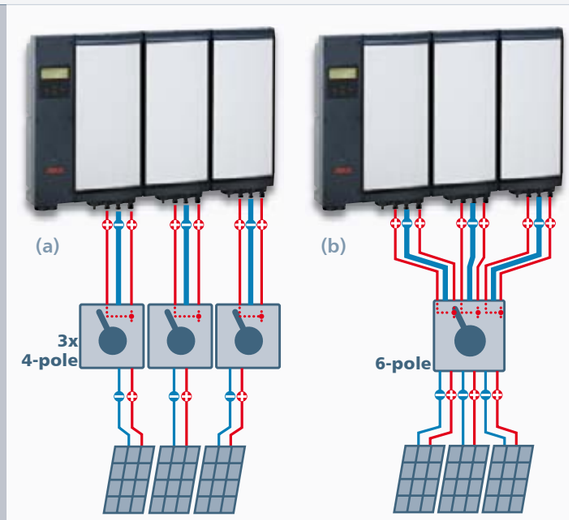
The parallel connection of the inputs is particularly suitable for high module currents (up to 16 A!) or for saving on DC cabling.



2 MPP-optimised module strings*

2 module strings are connected to the respective parallel-connected inputs of a master/slave system and controlled for optimum yield.

In variant (a) the DC disconnect is made up of two switches; in variant (b) there is just one switch.



3 MPP-optimised module strings*

3 module strings are connected to the respective parallel-connected inputs of a master/slave/slave system and controlled for optimum yield.

In variant (a) the DC disconnect is made up of three switches; in variant (b) there is just one switch.

*Negative poles are internal bridged in the inverter.

Service Information

for StecaGrid inverters.

Naturally we will provide you with our expert advice and support after your purchase, during installation, and during the long years of operation of your PV system

Replacement service

The modular design of the StecaGrid system, along with our rapid replacement service, ensure that your solar power system feeds the grid with maximum yields. In case of a StecaGrid inverter malfunctioning, it will be exchanged with a corresponding replacement device as quickly as possible by Steca or a Steca service partner ('advance replacement'). In this way, any loss of grid-feed remuneration is kept to a minimum if service is required.

Manufacturer's guarantee

Our StecaGrid products come with a 5-year guarantee as standard. Furthermore, we offer the system operator the chance to take out an extended guarantee of 10 years.

Replacement devices after the guarantee period

Even after the guarantee period is over, with our exchange devices at low inclusive prices, we help to ensure the continued economic efficiency of your solar power system.

Monitoring

If your solar power system is equipped with the relevant communication devices, it is possible to monitor your system remotely. Just ask for further information.

Training

According to your requirements, we can offer you training on our StecaGrid products, system configuration, or data communication.

Contact

In addition to the contact details you have, our hotline is available to you:

– Telephone: +49 (0) 700 STECAGRID
+49 (0) 700 783224743
– Fax: +49 (0) 8331 8558-132
– Email: service@stecasolar.com

Here you can get support without delay.

Product overview

StecaGrid 300/500		
StecaGrid 300-T	717.341	300 Wac inverter, transformerless, IP 20, Tyco plug
StecaGrid 300-M	717.342	300 Wac inverter, transformerless, IP 20, MC3 plug
StecaGrid 500-T	717.343	500 Wac inverter, transformerless, IP 20, Tyco plug
StecaGrid 500-M	717.344	500 Wac inverter, transformerless, IP 20, MC3 plug
StecaGrid Control D	717.345	Monitoring unit with display and MSD (ENS) for Germany
StecaGrid Control N	717.346	Monitoring unit with display (without MSD)
StecaGrid Remote	717.347	Wireless remote display for StecaGrid 300/500, only in combination with StecaGrid Control (D or N)
Operator protection adapter	717.637	30 mA, 230 V, 16 A residual current circuit breaker
StecaGrid AC connection cable	718.389	GST18 socket/angle plug connector, 3-pole, 1.5mm², length 1 m
StecaGrid 2000/2000+		
StecaGrid 2000+ Master-M	717.355	2000 Wac inverter, master unit with 2 MPPT (2 x 8 A or 1 x 16 A), central data logger and display, IP 65, MC4
StecaGrid 2000+ D Master-M	717.356	2000 Wac inverter, master unit with 2 MPPT (2 x 8 A or 1 x 16 A), central data logger, display and MSD, IP 65, MC4
StecaGrid 2000+ Slave-M	719.345	2000 Wac inverter, slave unit with 2 MPPT (2 x 8 A or 1 x 16 A) for extending the StecaGrid 2000 / 2000+ Master, IP 65, MC4
StecaGrid 2000 Master-M	717.349	2000 Wac inverter, master unit with 2 MPPT (2 x 5 A or 1 x 10 A), central data logger and display, IP 55, MC4
StecaGrid 2000 D Master-M	717.350	2000 Wac inverter, master unit with 2 MPPT (2 x 5 A or 1 x 10 A), central data logger, display and MSD, IP 55, MC4
StecaGrid 2000 Master-T	717.348	2000 Wac inverter, master unit with 2 MPPT (2 x 5 A or 1 x 10 A), central data logger and display, IP 55, Tyco
StecaGrid 2000 D Master-T	717.311	2000 Wac inverter, master unit with 2 MPPT (2 x 5 A or 1 x 10 A), central data logger, display and MSD, IP 55, Tyco
StecaGrid 2000 Slave-M	717.351	2000 Wac inverter, slave unit with 2 MPPT (2 x 5 A or 1 x 10 A) for extending the StecaGrid 2000 / 2000+ Master, IP 65, MC4
StecaGrid 2000 Slave-T	717.312	2000 Wac inverter, slave unit with 2 MPPT (2 x 5 A or 1 x 10 A) for extending the StecaGrid 2000 / 2000+ Master, IP 65, Tyco
StecaGrid Connect	717.352	Network/PC connection for StecaGrid 2000 / 2000+ master or master/slave systems
StecaGrid 2000/2000+ fuse	719.498	Replacement fuse for StecaGrid 2000 / 2000+ master or master/slave systems, pack of 12
DC circuit breaker		
4-pole DC circuit breaker	719.672	4-pole DC circuit breaker, 16 A, 500 V, in IP 65 casing 180 mm x 182 mm x 110 mm, 8 x M16 screw connections
6-pole DC circuit breaker	719.671	6-pole DC circuit breaker, 16 A, 500 V, in IP 65 casing 180 mm x 182 mm x 165 mm, 12 x M16 screw connections
6-pole DC circuit breaker	722.402	6-pole DC circuit breaker, 6 A, 125 V, in IP 65 casing 200 mm x 125 mm x 122 mm
DC connection accessories		
MC3- to MC4+ adaptor cable	720.087	Adaptor cable to connect MC3- to MC4+, total length 200 mm, PV-A-KBT4/KST3
MC3+ to MC4- adaptor cable-	720.088	Adaptor cable to connect MC3+ to MC4-, total length 200 mm, PV-A-KBT3/KST4
MC4 PV junction socket	719.623	Y-plug for parallel connection of the plus inputs on the StecaGrid 2000/2000+, PV-AZB4
MC4 coupling plug	719.621	Coupling plug as individual part, cable cross-section 4 - 6 mm², PV-KST4/6II
MC4 coupling socket	719.622	Coupling socket as individual part, cable cross-section 4 - 6 mm², PV-KBT4/6II
Adaptor cable set 4 x Tyco/ loose end	718.916	Includes 2 x plus and 2 x minus, Tyco socket, total length 225 mm each, suitable for StecaGrid Master-T and Slave-T

Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com

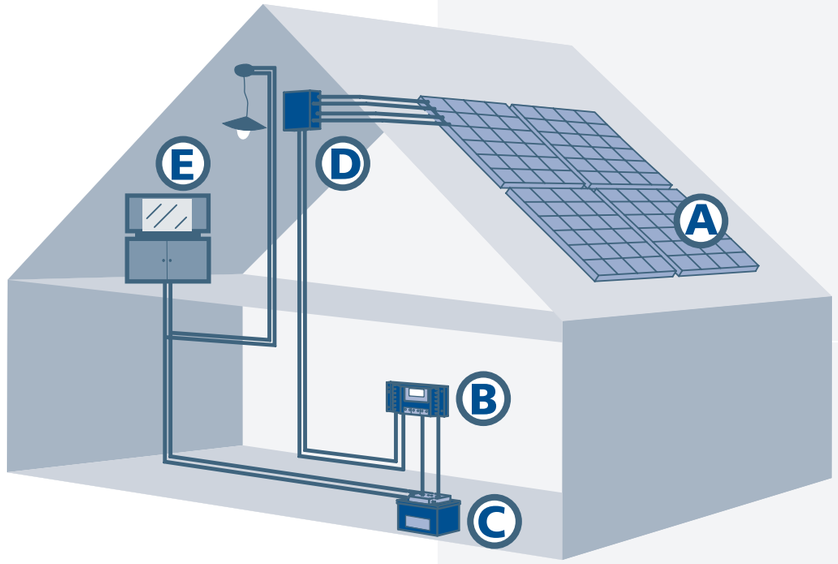
Power from the sun ...

... for rural electrification

Two billion people in rural areas still have no access to an electricity grid. Steca has set itself the target of improving the quality of life of these people. To this end, Steca develops and manufactures top-quality products which, thanks to their long lifetime, ensure extremely low costs.

Today, modern and professional electricity supplies are necessary in every part of the world. For these supplies, the focus is on high industrial demands, flexibility, environmental sustainability and reliability. Steca system technology for hybrid and telecommunication systems unites these aspects, thereby creating a basis for the forthcoming multimedia and communication age.

Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com



Legend:

A Generator
B Solar Charge Controller
C Battery
D Generator connection box
E Current Consumer (12 V-)

Solar home systems

with Steca solar charge controllers

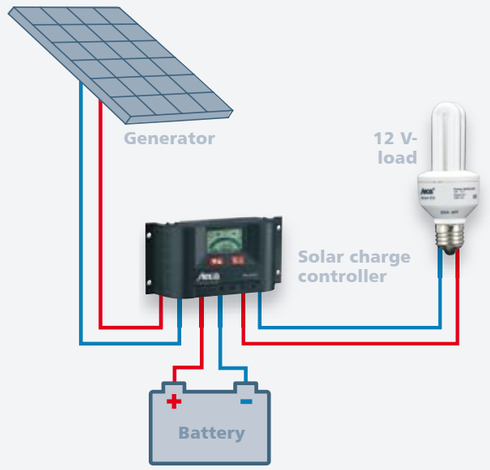
A solar home system consists of a Steca solar charge controller, one or more solar modules, a battery and the connected loads.

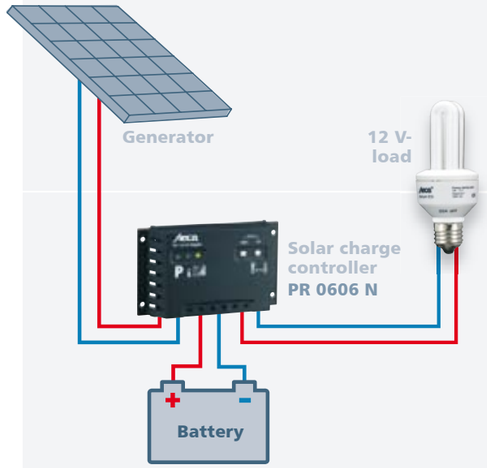
The solar charge controller is connected directly to the battery using as short a cable as possible, and fixed to the wall near to the battery, so that it can be effectively cooled by the passing air flow.

In principle, the battery is always connected to the charge controller first. Then the solar module field is connected to the solar module input of the charge controller. Only direct current loads are used in solar home systems. They are connected directly to the load output of the charge controller. This means the Steca solar charge controllers always show the exact charge status of the battery, and thus ensure optimal battery maintenance in all situations. Various Steca energy-saving lights, Steca solar cooling units, DC-to-DC converters and other appliances can be used.

The Steca solar charge controllers control the energy flow of the entire system. They make sure that the solar module charges the battery quickly and effectively, but they also protect the battery against overcharging. If the loads discharge the battery, the charge controller, thanks to its precision in calculating the charge status, switches off the load at exactly the right moment, thus protecting the battery from the dangers of deep discharge.

Furthermore, Steca charge controllers are equipped with an intelligent battery monitoring system. The most effective charging method is selected according to the requirements of the batteries. The charge controller is the central controlling component in solar home systems, since it affects all the functions of the system. For this reason, it is important to choose a reliable and efficient charge controller.





Night Light Systems

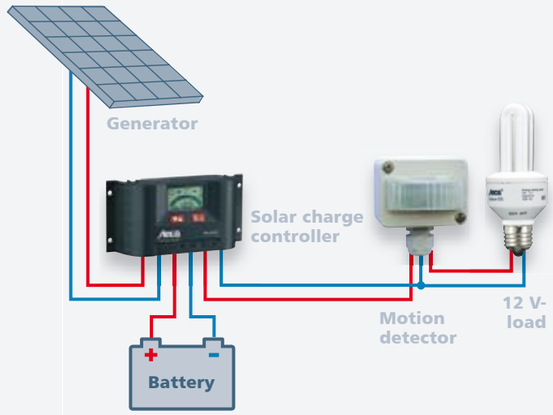
An important special application of solar home systems are the so-called night light systems.

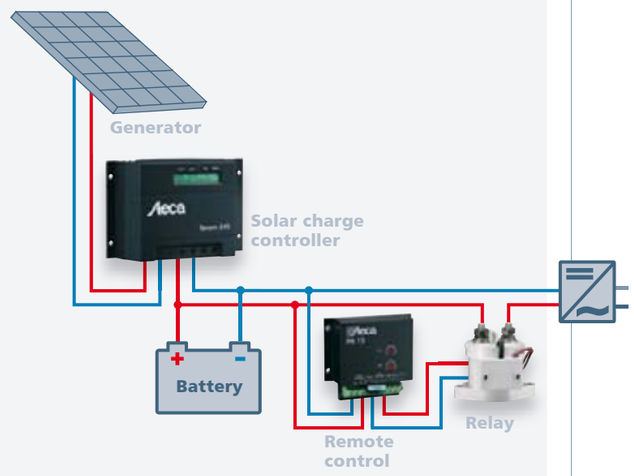
These fit with the design of the solar home systems, but are equipped with a special Steca charge controller which automatically turns on the connected lights for a set time after sunset, and turns them off again the next morning. These systems are perfectly suited for street lamps and automatic night-time lighting.

Another special model makes these systems into the ideal solution for bus stops and similar applications. Operating in conjunction with a motion detector, the lamp is only turned on at night time when movement is detected in a specified area. After a few minutes, the light is then automatically turned off again. This function can be implemented with any Steca night light charge controller by connecting it to an external motion detector.

"Light on" function: / Charge controller:	all night	after sunset	before sunrise	turn-on time delay	maximum light current	catalogue page
PR 0606N / PR 1010N	■	0 - 6 h	0 - 6 h	–	10 A	32
Solarix Alpha / Gamma / Sigma / Omega	■	–	–	–	30 A	30
Solarix PRS	■*	0 - 12 h*	–	–	30 A	31
PR 1010 - PR 3030	■	0 - 8 h	–	–	30 A	28
Solarix Tarom / Power Tarom PA 15 / PA 15 with relay PA EV 200	■	0 - 12 h	–	0 - 3 h	15 A 200 A	34/35 38

** Only in projects with high volume per single order.*
The kind of night-light functionality must be specified with the order.





Steca's Charging Technology

The performance of our products is shown by the accuracy of the state of charge (SOC) measurement, which results in the long life-time of the battery.

What does SOC mean?

The SOC (State of Charge) indicates the actual charging status of the battery. If the battery is fully charged the SOC is 100 % - if it is completely empty the SOC is 0 %. All values in between are possible, but a lot of battery types should not reach SOC values less than 30 %. It is important not to confuse the SOC with the capacity of the battery. The SOC does not reflect the remaining capacity of the battery. The actual remaining capacity of the battery is influenced by a lot of parameters besides the SOC. Multiplying the SOC with the nominal capacity of the battery results in information about the residual capacity of the battery. This value does still not reflect the remaining capacity accurately due to various other parameters including the age of the battery.

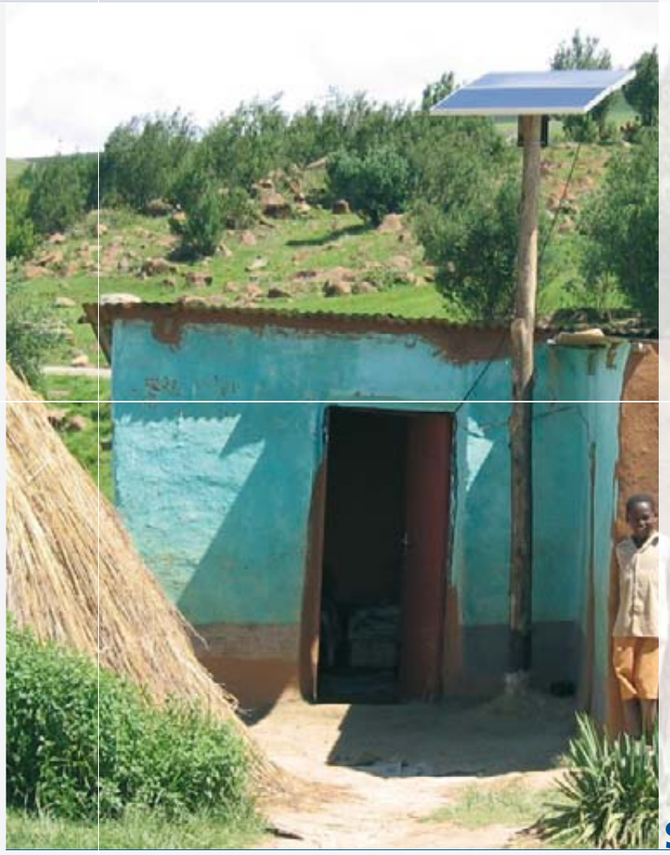
Why is SOC calculation important?

If a battery is charged, the charge controller needs to know if it is full to prevent battery damage due to over charging. While discharging, the controller needs to know if the battery is empty in order to prevent dangerous deep discharging. There are several possibilities to determine if the battery is full or empty. The most common criterion is the voltage of the battery. A certain fixed voltage is set to disconnect the load and protect the battery. Unfortunately this criterion is improper. Especially in solar systems, low discharging currents are common and lead to improper battery maintenance if a fixed voltage for load disconnection is used. Better solutions also take the charging / discharging current into account to determine if the battery has to be disconnected from the load. But also this method does not allow an adequate load disconnection to protect the battery optimally due to a very low accuracy and a high error rate. A lot of additional parameters, like temperature, the age of the battery, the user behaviour and other values, influence the battery.

Only an accurately calculated state of charge allows to disconnect the load correct according to the properties of the battery. This is why Steca developed a powerful and precise algorithm to determine the actual state of charge of a battery.

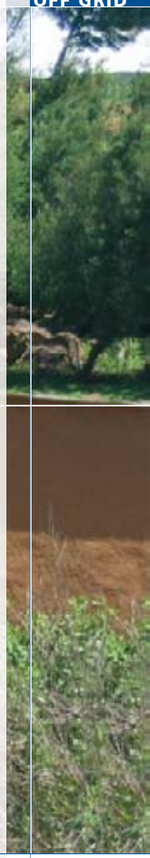
How does the Steca SOC algorithm work?

The Steca state of charge algorithm is a combination of different methods in order to ensure a precise calculation combined with a stable long time performance. Cost optimised product realisation is additionally another important point for Steca. Years of experience in this field and important research activities led to a self learning „fuzzy logic" algorithm. It takes into account the user behaviour and the ageing of the battery. The voltage of the battery, as well as all battery currents, are watched closely by the charge controller in combination with the temperature. The charger approximates the SOC, during a learning period which takes place in the first cycles. By monitoring the battery and adapting parameters to the changes, a self learning algorithm results that is also able to take the use of the battery into account. This characteristic makes the Steca SOC algorithm a powerful and reliable function, which will ensure the correct monitoring of the battery. The user benefits from a fast and precise information about the battery status that is displayed on the charge controller. Finally the user benefits from the most important advantage to enlarge the life-time of the battery with the help of an optimised battery maintenance.



Which chargers from Steca carry the optimised algorithm?

The Steca product range is divided into two lines. One is optimised for use in simple applications with less demand and equipped with the minimum necessary features. The other line is designed to cover high-end demand to supply a good communication interface to the user and optimised battery maintenance features. For both lines there exist charge controllers in a wide power range. All chargers equipped with the special Steca State of Charge algorithm are marked with the SOC symbol in this catalogue.



State of charge control

S O C – state of charge

Example

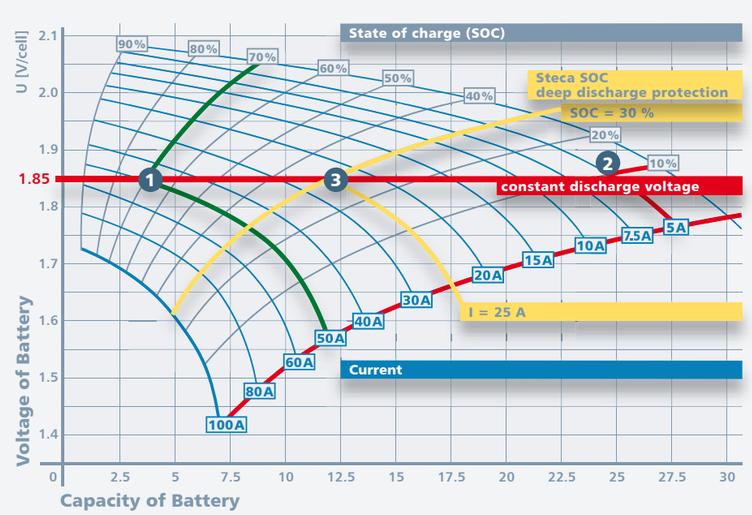
The graph shows the properties of a 28 Ah lead acid battery in relation to the charging/discharging current, the voltage and the state of charge. If the full battery is discharged with 50 A and a load cut off voltage of 1.85 V/cell is applied (equal to 11.1 V for 12 V battery) the load will be disconnected at around 70 % state of charge (point 1). This means the battery is still quite full but the load can no longer be supplied due to deep discharging protection.

With the Steca SOC algorithm the load will be disconnected along the line of 30 % SOC in dependence of the discharging current at the cross with the discharging current line.

Only this complicated procedure can ensure optimal battery maintenance.

If it is discharged with 5 A, the voltage of 11.1 V will lead to a disconnection at 10 % state of charge which is already a dangerous deep discharge for the battery (point 2).

Only having a discharge current of 25 A the battery would be disconnected at 30% SOC (point 3).



Steca PR

PR 0303, PR 0505

The photovoltaic controllers PR 0303 and PR 0505 are used in small solar home systems with either a 3 or 5 A solar charging and load current capacity (up to 75 Wp). Loads such as lights, radios or small TVs can be switched „off" manually on the controller without additional wall mounted switches. In professional applications such as telecommunication, the controller can also be used in small photovoltaic power supply systems. Thanks to the universal series switching technology the controller can be used with amorphous, thin film and crystalline solar modules.

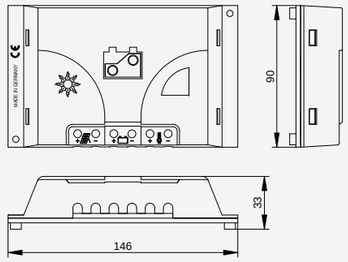
Features

- Automatic electronic fuse
- Manual load switch
- PWM series battery charging
- Boost- and Float charging
- Current compensated deep discharge protection (SOC / LVD)
- Automatic load reconnection
- Temperature compensation
- Positive grounding (or) Negative grounding on one terminal

Electronic Protections

- High voltage disconnect (HVD)
- Low voltage disconnect (LVD) current compensated
- Reverse polarity of solar modules
- Reverse polarity of load & battery
- Electronic fuse
- Short circuit of solar modules
- Short circuit of load
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Technical data



Solar Charge Controller	PR 0303	PR 0505
System voltage	12 V	
Max. input voltage	47 V	
Max. module input short circuit current	3 A	5 A
Max. load output current	3 A	5 A
Max. self consumption	3 mA	
End of charge voltage (float)	13.7 V	
Boost charge voltage	14.4 V	
Equalisation charge	-	
Reconnection setpoint (LVR)	12.5 V	
Deep discharge protection (LVD)	11.0 V ...11.5 V	
Ambient temperature allowed	-25 °C ...+50 °C	
Terminal size (fine/single wire)	6 mm² / 10 mm²	
Enclosure protection class	IP 32	
Weight	160 g	
Dimensions l x w x h	146 x 90 x 33 mm	

Technical data at 25 °C / 77 °F

Power class
3 A - 5 A

Displays

3 LEDs

- LED 1: yellow – battery charging LED - by solar module
- LED 2: green – battery full
- LED 3: red – battery empty

Certificates

- Approved for Worldbank funded projects in Laos
- Made in Germany
- Conform to European Standards (CE)
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Steca Solsum

5.0c, 8.0c, 6.6c, 8.8c, 10.10c

One of Steca's bestsellers are the photovoltaic controllers of the Solsum C series which are used in small solar home systems with a 5 to 10 A solar charging and load current capacity (up to 240 Wp). The Solsum C series was launched in 2004 as a redesign of the Solsum X series. The C series advantages are large connection terminals, fully covered PCB and a easy to understand display. The through hole components assure easy local maintenance.

Features

- Voltage regulation
- PWM shunt battery charging
- Boost- and Float charging
- Automatic load reconnection
- Automatic selection of voltage (12 V / 24 V)
- Temperature compensation

Electronic Protections

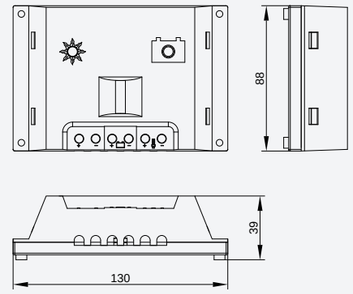
- High voltage disconnect (HVD)
- Low voltage disconnect (LVD), not 5.0c and 8.0c
- Reverse polarity of solar modules
- Reverse polarity of load and battery
- Short circuit of solar modules
- Short circuit of load
- Over temperature
- Over voltage
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Displays

2 LEDs

- LED 1: yellow – battery charging LED - by solar module
- LED 2: green – battery full
- LED 2: red – battery empty

Technical data



Solar Charge Controller	Solsum 5.0c	Solsum 8.0c	Solsum 6.6c	Solsum 8.8c	Solsum 10.10c
System voltage	12 V (24 V)				
Max. input voltage	47 V				
Max. module input short circuit current	5 A	8 A	6 A	8 A	10 A
Max. load output current	5 A	8 A	6 A	8 A	10 A
LVD	-	-	✓	✓	✓
Max. self consumption	4 mA				
End of charge voltage (float)	13.7 V (27.4 V)				
Boost charge voltage; 2 h	14.4 V (28.8 V)				
Equalisation charge	-				
Reconnection setpoint (LVR)	without LVR		12.6 V (25.2 V)		
Deep discharge protection (LVD)	without LVD		11.1 V (22.2 V)		
Ambient temperature allowed	-25 °C ... +50 °C				
Terminal size (fine/single wire)	2.5 mm² / 4 mm²				
Enclosure protection class	IP 32				
Weight	165 g				
Dimensions l x w x h	130 x 88 x 39 mm				

Technical data at 25 °C / 77 °F

Power class
5 A - 10 A

Certificates

- Approved for Worldbank funded projects in Indonesia by TÜV
- Listed for Worldbank funded projects in Bangladesh, China, Laos, Nepal, Sri Lanka, Uganda
- Compliant to the use in tropical areas (DIN IEC 68 part 2-30)
- Conform to European Standards (CE)
- Manufactured in an ISO 9001 facility

Steca PR

PR 1010, PR 1515, PR 2020, PR 3030

The Steca PR charge controllers were launched in 2004 as the fifth generation of charge controller technology (up to 900 Wp). This state of the art product upgrades the Steca Solarix series by a customer designed LCD which shows the accurate state of charge (SOC) in percent and as battery gauge symbol. The heart of the controller is the integrated circuit called ATONIC®II, which contains the improved regulation software based on a self learning algorithm.

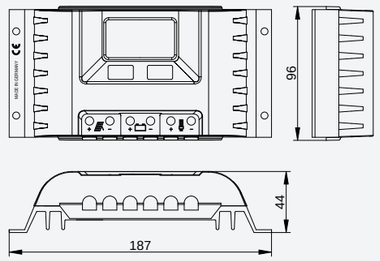
Features

- PWM shunt battery charging
- State of charge (SOC) battery regulation
- Built in Ah counter
- Boost-, Equalising -, Float charging
- Automatic load reconnection
- Manual load switch
- Automatic selection of voltage (12 V / 24 V)
- Temperature compensation
- Data logger
- Positive grounding (or) Negative grounding on one terminal
- Field adjustable parameters by two buttons
- Lighting control options during nighttime
- Interface to prepayment unit
- Optional: external temperature sensor

Electronic Protections

- High voltage disconnect
- Low voltage disconnect
- Dept of discharge disconnection (DOD)
- Reverse polarity of solar modules
- Reverse polarity of load & battery
- Electronic fuse
- Short circuit of solar modules
- Short circuit of load
- Over temperature
- Over voltage
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Technical data



Solar Charge Controller	PR 1010	PR 1515	PR 2020	PR 3030
System voltage	12 V (24 V)			
Max. input voltage	47 V			
Max. module input short circuit current	10 A	15 A	20 A	30 A
Max. load output current	10 A	15 A	20 A	30 A
Max. self consumption	12 mA			
End of charge voltage (float)	liquid 13.9 V (27.8 V); gel 14.1 V (28.2 V)			
Boost charge voltage; 2 h	14.4 V (28.8 V)			
Equalisation charge (deactivated for gel accu); 2 h	14.7 V (29.4 V)			
Reconnection setpoint (SOC/LVR)	> 50 % / 12.6 V (25.2 V)			
Deep discharge protection (SOC/LVD)	< 30 % / 11.1 V (22.2 V)			
Ambient temperature allowed	-10 °C...+50 °C			
Terminal size (fine/single wire)	16 mm² / 25 mm²			
Enclosure protection class	IP 32			
Weight	350 g			
Dimensions l x w x h	187 x 96 x 44 mm			

Technical data at 25 °C / 77 °F

Power class
10 A - 30 A

Displays

- Steca designed LCD in symbols and digits showing SOC, Vbat, all currents, Ah, alarms, day/night and more

Certificates

- Listed for Worldbank funded projects in Nepal
- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Steca PR 2020-IP

IP 65 Version

The PR 2020-IP design is based on Steca's PR charge controller series with a customer designed LCD which shows the accurate state of charge (SOC) in percent and as battery gauge symbol. The heart of the controller is the integrated circuit called ATONIC® II, which contains the improved regulation software based on a self learning algorithm. The PR 2020-IP controller operates in harsh environments like salt, moisture and dust.

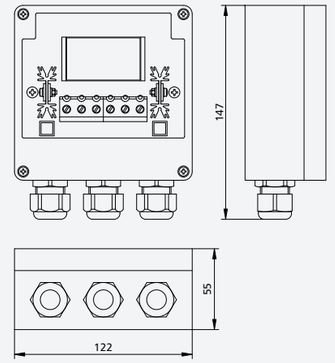
Features

- PWM shunt battery charging
- State of charge (SOC) battery regulation
- Built in Ah counter
- Boost-, Equalising-, Float charging
- Automatic load reconnection
- Automatic selection of voltage (12 V / 24 V)
- Temperature compensation
- Positive grounding (or) Negative grounding on one terminal
- Field adjustable parameters by two buttons
- Lighting control options during nighttime
- Optional potential free alarm contact
- Optional: external temperature sensor

Electronic Protections

- High voltage disconnect (HVD)
- Low voltage disconnect (LVD)
- Dept of discharge disconnection (DOD)
- Reverse polarity of solar modules
- Reverse polarity of load & battery
- Short circuit of solar modules
- Short circuit of load
- Over temperature
- Over voltage
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Technical data



Solar Charge Controller	PR 2020-IP
System voltage	12 V (24 V)
Max. input voltage	47 V
Max. module input short circuit current	20 A
Max. load output current	20 A
Max. self consumption	12 mA
End of charge voltage (float)	liquid 13.9 V (27.8 V); gel 14.1 V (28.2 V)
Boost charge voltage; 2 h	14.4 V (28.8 V)
Equalisation charge (deactivated for gel accu); 2 h	14.7 V (29.4 V)
Reconnection setpoint (SOC / LVR)	> 50 % / 12.6 V (25.2 V)
Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)
Ambient temperature allowed	-10 °C...+50 °C
Terminal size (fine / single wire)	16 mm² / 25 mm²
Enclosure protection class	IP 65
Weight	350 g
Dimensions l x w x h	122 x 55 x 147 mm

Technical data at 25 °C / 77 °F

Power class
20 A

Displays

- Steca designed LCD in symbols and digits showing SOC, Vbat, all currents, Ah, alarms, day/night and more

Certificates

- Conform to European Standards (CE)
- Made in Germany

Steca Solarix

Alpha, Gamma, Sigma, Omega

Steca's Solarix series is the world's most sold PV charge controller for the use in medium sized solar home systems and PV power supplies in the range of 8 to 30 A (up to 900 Wp). The heart of the controller is the integrated circuit called ATONIC®, which contains the regulation software based on a self learning algorithm. The result is an accurate state of charge (SOC) metering of the battery, the best insurance for a long battery lifetime.

Features

- PWM shunt battery charging
- State of charge (SOC) battery regulation
- Boost-, Equalising-, Float charging
- Automatic load reconnection
- Automatic selection of voltage (12 V / 24 V)
- Temperature compensation
- Positive grounding (or) Negative grounding on one terminal
- Field adjustable parameters by jumpers on PCB
- Optional: operates load only by night
- Optional: external temperature sensor
- Night-light function

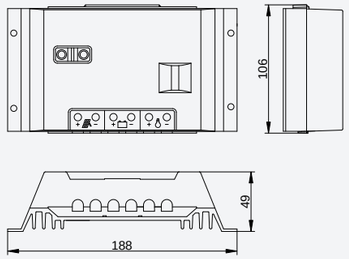
Electronic Protections

- High voltage disconnect
- Low voltage disconnect
- Dept of discharge disconnection
- Reverse polarity of solar modules
- Reverse polarity of load & battery
- Short circuit of solar modules
- Short circuit of load
- Over temperature
- Over voltage
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Displays

- PV system LED
- state of charge LED

Technical data



Solar Charge Controller	Alpha	Gamma	Sigma	Omega
System voltage	12 V (24 V)			
Max. input voltage	47 V			
Max. module input short circuit current	8 A	12 A	20 A	30 A
Max. load output current	8 A	12 A	20 A	30 A
Max. self consumption	5 mA			
End of charge voltage (float)	13.7 V (27.4 V)			
Boost charge voltage; 1 h	14.4 V (28.8 V)			
Equalisation charge (deactivated for gel accu); 1 h	14.7 V (29.4 V)			
Reconnection setpoint (SOC/LVR)	> 50 % / 12.6 V (25.2 V)			
Deep discharge protection (SOC/LVD)	< 30 % / 11.1 V (22.2 V)			
Ambient temperature allowed	-25 °C...+50 °C			
Terminal size (fine/single wire)	16 mm² / 25 mm²			
Enclosure protection class	IP 32			
Weight	420 g			
Dimensions l x w x h	188 x 106 x 49 mm			

Technical data at 25 °C / 77 °F

Power class
8 A - 30 A

Certificates

- Approved for Worldbank funded projects in Indonesia by TÜV
- Listed for Worldbank funded projects in Bangladesh, China, Laos, Nepal, Sri Lanka, Uganda
- Certificate ONE / KfW funded projects in Morocco
- Compliant to the use in tropical areas (DIN IEC 68 part 2-30)
- Conform to European Standards (CE)
- UL listing in 1999
- Made in Germany
- TÜV Worldbank spec
- ThermieB: SUP-995-96 (Morocco)
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Steca Solarix PRS

The simplicity and high performance of the new Steca Solarix PRS solar charge controller make it particularly attractive. At the same time, it offers a modern design and a convenient display, all at an extremely attractive price.

Several LEDs in various colours emulate a tank display, which gives information on the charge status of the battery. Here, Steca's latest algorithms are employed in order to guarantee optimal battery maintenance. The Solarix PRS charge controllers are equipped with an electronic fuse, thus ensuring the optimal protection. They operate on the serial principle, and separate the solar module from the battery in order to protect it against overcharging.

The Solarix PRS charge controllers are universal charge controllers, which means they can be used with lead-acid batteries or gel batteries without the need for complex configuration settings.

For larger projects, the charge controllers can also be equipped with special functions. These include the night light function, selectable charging plateau and deep-discharge protection voltages.

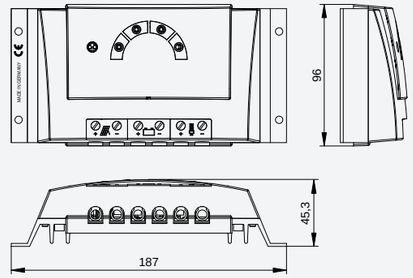
Functions

- Low-loss serial controller
- PWM-controlled constant-voltage charging
- Battery charging with automatic charging mode selection (float, boost, equal)
- Recognises and carries out a maintenance charge (boost charge every 30 days if idle)
- Automatically adjusts to the voltage level 12 V/24 V
- Current-dependent load deactivation
- Automatic load reactivation
- Temperature compensation
- Grounding on the plus side

Display

- 4 separate LEDs to display the battery charge status
- LEDs (red/green) to display the function status

Technical data



Solar charge controller with LED	PRS 1010	PRS 1515	PRS 2020	PRS 3030
System voltage	12 V (24 V)			
Max. input voltage	47 V			
Battery input voltage	9.0 V - 17.0 V (17.1 V - 34.0 V)			
Max. module input short circuit current	10 A	15 A	20 A	30 A
Max. load output current	10 A	15 A	20 A	30 A
Max. self consumption	< 4 mA			
End of charge voltage (float)	13.9 V (27.8 V)			
Boost charge voltage; 2 h	14.4 V (28.8 V)			
Equalisation charge; 2 h	14.7 V (29.4 V)			
Reconnection setpoint (SOC/LVR)	> 50 %/12.5 V (25.0 V)			
Deep discharge protection (SOC/LVD)	< 30 %/11.1 V (22.2 V)			
Ambient temperature allowed	-25 °C ... +50 °C			
Terminal size (fine/single wire)	16 mm²/25 mm²			
Enclosure protection class	IP 32 / IP 34			
Weight	ca. 350 g			
Dimensions l x w x h	187 x 96 x 45.3 mm			

Technical data at 25 °C / 77 °F

Power class
10 A - 30 A

Electronic protection functions

- Battery-overload protection
- Deep-discharge protection
- Automatic electronic fuse
- Reverse-polarity protection at module input, of the load and the battery connection
- Short-circuit protection of the load and the module
- Good electromagnetic compatibility
- Idling protection in case no battery is connected
- Prevention of back current into the module
- Integrated temperature compensation of the end-of-charge voltage (0 °C to +50 °C, factor -4mV/K/cell)

Certificates

- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility
- Conform to European Standards (CE)

Steca PR Night

PR 0606N, PR1010N

The Steca PR Night is a solar lighting controller (up to 300 Wp) for automatic lighting control in various applications such as PV powered streetlights, bus shelters or billboard lighting. The controller detects day and night using the PV array. An entirely new feature is the integrated clock that sets itself automatically based on the levels of brightness detected during a 24 hour day. There are two major options: the light switches on after sunset; the light switches on before sunrise.

Features

- PWM shunt battery charging
- State of charge (SOC) battery regulation
- Boost-, Equalising-, Float charging
- Automatic load reconnection
- Automatic selection of voltage (12 V / 24 V)
- Temperature compensation
- Positive grounding (or) Negative grounding on one terminal
- Field adjustable parameters by two buttons
- Factory adjustable
- Night-light function

Electronic Protections

- High voltage disconnect
- Low voltage disconnect
- Dept of discharge disconnection
- Reverse polarity of solar modules, load and battery
- Electronic fuse
- Short circuit protection
- Lightning protection by varistor
- Reverse current at night

Displays

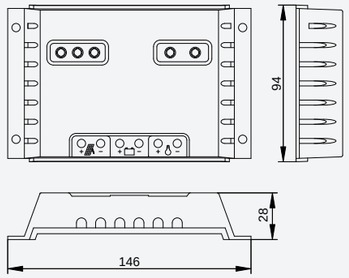
3 LEDs

- LED 1: adjustment mode
- LED 2: PV system
- LED 3: state of charge

Certificates

- Approved for Worldbank funded projects in Laos
- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Technical data



Street-light Solar Charge Controller	PR 0606N	PR 1010N
System voltage	12 V (24 V)	
Max. input voltage	47 V	
Max. module input short circuit current	6 A	10 A
Max. load output current	6 A	10 A
Max. own consumption	6 mA	
End of charge voltage (float)	13.7 V (27.4 V)	
Boost charge voltage; 2 h	14.4 V (28.8 V)	
Equalisation charge programmable (deactivated for gel accu); 2 h	14.7 V oder 15.0 V (29.4 V)	
Reconnection setpoint (SOC/LVR)	> 50 % / 12.6 V (25.2 V)	
Deep discharge protection (SOC/LVD)	< 30 % / 11.1 V (22.2 V)	
Ambient temperature allowed	-25 °C ... +50 °C	
Terminal size (fine/single wire)	6 mm² / 10 mm²	
Enclosure protection class	IP 22	
Weight	120 g	
Dimensions l x w x h	146 x 94 x 28 mm	
Night-light function	19 h - 3 h	
Morning-light function	23 h - 7 h	
Motion detector	**Steca PA IRS 1008/180**	
Battery nominal voltage	12 V	
Reach/detection area	7 m/180°	
Max. load output current	5 A	
Own consumption	> 2 mA	
Turn on time	1 - 5 Min.	
Enclosure protection class	IP 65	

Technical data at 25 °C / 77 °F

Power class
6 A - 10 A

0 A | 50 A | 100 A | 150 A

SHS | RV | 240 W | COM

Steca PA IRS 1008/180

motion detector

The Steca PA IRS 1008/180 motion detector is connected to the load output of the night light charge controller. This supplies power to the light, which is then turned on for a few minutes when some movement is detected. The Steca IRS 1008/180 stands out, through its extremely low own consumption, and is therefore optimal for use in solar power systems.

Steca Solarix

2401, 4401

The Steca Solarix 2401 and 4401 controllers complete the product range of the Solarix Omega 30 A controller to 40 A solar current, available in 12 V, 24 V and 48 V. The load current is limited to 10 A. The charging procedures are based on voltage levels which can be individually adjusted by four buttons behind the front cover.

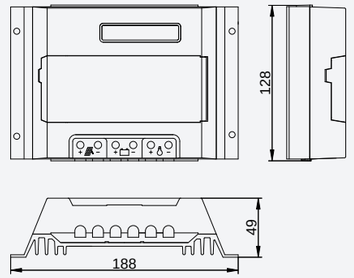
Features

- Voltage regulation
- PWM shunt battery charging
- Boost-, Equalising-, Float charging
- Automatic load reconnection
- Automatic selection of voltage for 12 V / 24 V
- Temperature compensation
- Positive grounding (or) Negative grounding on one terminal
- Field adjustable parameters by four buttons
- RJ45 interface
- Optional: external temperature sensor

Electronic Protections

- High voltage disconnect
- Low voltage disconnect
- Reverse polarity of solar modules
- Reverse polarity of load & battery
- Short circuit of solar modules
- Short circuit of load
- Over temperature
- Over voltage
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Technical data



Solar Charge Controller		2401	4401
System voltage		12 V (24 V)	48 V
Max. input voltage		47 V	82 V
Max. module input short circuit current		40 A	40 A
Max. load output current		10 A	10 A
Max. own consumption		14 mA	
programable	End of charge voltage (float)	13.7 V (27.4 V)	54.8 V
	Boost charge voltage; 2 h	14.4 V (28.8 V)	57.6 V
	Equalisation charge (deactivated for gel accu); 2 h	14.7 V (29.4 V)	58.8 V
	Reconnection setpoint (LVR)	12.6 V (25.2 V)	50.4 V
	Deep discharge protection (LVD)	11.1 V (22.2 V)	44.4 V
Ambient temperature allowed		-10 °C...+60 °C	
Terminal size (fine / single wire)		16 mm² / 25 mm²	
Enclosure protection class		IP 22	
Weight		550 g	
Dimensions l x w x h		188 x 128 x 49 mm	

Technical data at 25 °C / 77 °F

Power class
40 A

0 A | 50 A | 100 A | 150 A

SHS | COM | RV | 1920 W | 12.8 V LCD

Displays

- One line LCD displaying the voltage of the battery and all currents

Certificates

- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Steca Tarom
235, 245, 440

The Steca Tarom is the high-end solar charge controller optimally designed for demanding telecom applications and complex off-grid PV hybrid system architectures. A huge variety of exiting features allows the user to adapt this controller to the special needs of the specific installation.

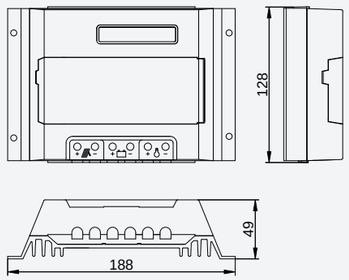
The optimised SOC calculation of Steca is implemented in the Tarom. It is your best choice for the medium and large power range (up to 2400 Wp) on three voltage levels (12 V, 24 V, 48 V). Additionally it is possible to connect further devices like a temperature sensor, a datalogger and a remote switch to configure and monitor the photovoltaic system optimally. A built-in Ah counter gives additional valuable energy balance information to the user.

Features
- PWM shunt battery charging
- State of charge (SOC) battery regulation
- Energy management for hybrid systems
- Built-in Ah counter
- Boost-, Equalising-, Float charging
- Automatic load reconnection
- Automatic selection of voltage for 12 V / 24 V
- Temperature compensation
- Positive grounding (or) Negative grounding on one terminal
- Field adjustable parameters by four buttons
- Lighting control options during nighttime with PA 15
- RJ45 interface
- Manual load disconnect
- Optional: external temperature sensor

Displays
- Two line LCD showing SOC, Vbat, all currents, Ah, alarms, charging procedure

Certificates
- Listed for Worldbank funded projects in Nepal
- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

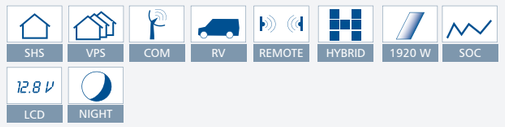
Technical data



Solar Charge Controller	Tarom 235	Tarom 245	Tarom 440
System voltage	12 V (24 V)		48 V
Max. input voltage	47 V		82 V
Max. module input short circuit current	35 A	45 A	40 A
Max. load output current	35 A	45 A	40 A
Max. self consumption	14 mA		
programable: End of charge voltage (float)	13.7 V (27.4 V)		54.8 V
programable: Boost charge voltage; 2 h	14.4 V (28.8 V)		57.6 V
programable: Equalisation charge (deactivated for gel accu); 2 h	14.7 V (29.4 V)		58.8 V
programable: Reconnection setpoint (SOC / LVR)	> 50 % / 12.6 V (25.2 V)		> 50 % / 50.4 V
programable: Deep discharge protection (SOC / LVD)	< 30 % / 11.1 V (22.2 V)		< 30 % / 44.4 V
Ambient temperature allowed	-10 °C...+60 °C		
Terminal size (fine / single wire)	16 mm² / 25 mm²		
Enclosure protection class	IP 32		
Weight	550 g		
Dimensions l x w x h	188 x 128 x 49 mm		

Technical data at 25 °C / 77 °F

Power class
30 A - 45 A



Electronic Protections
- High voltage disconnect
- Low voltage disconnect
- Dept of discharge disconnection
- Reverse polarity of solar modules
- Reverse polarity of load and battery
- Short circuit of solar modules
- Short circuit of load
- Over temperature
- Over voltage
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Steca PowerTarom
2070, 2140, 4055, 4110, 4140

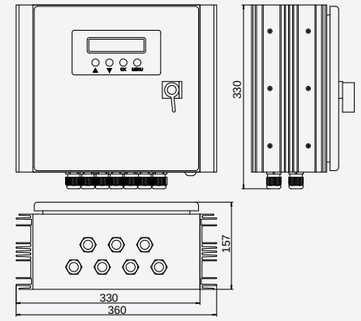
Designed for industrial and outdoor applications, Steca PowerTarom controllers come in a IP 65 powder painted steel enclosure for the large power range (up to 8400 Wp) on three voltage levels (12 V, 24 V, 48 V). Power Tarom controllers are based on the same technology as the Steca Tarom controllers. If you connect them in parallel on a common DC bus power line, several controllers operate in one single PV or PV hybrid system in the range up to 20 kWp of solar power.

(For more information about Steca hybrid systems see page 46-47)

Features
- PWM shunt battery charging
- State of charge (SOC) battery regulation
- Built-in Ah counter
- Boost-, Equalising-, Float charging
- Automatic load reconnection
- Automatic selection of voltage for 12 V / 24 V
- Temperature compensation
- Positive grounding (or) Negative grounding on one terminal
- Field adjustable parameters by four buttons
- Lighting control options during nighttime
- RJ45 interface
- Manual load disconnect
- Dry contact
- Optional: external temperature sensor

Electronic Protections
- High voltage disconnect
- Low voltage disconnect
- Dept of discharge disconnection
- Reverse polarity of solar modules
- Reverse polarity of load & battery
- Short circuit of solar modules
- Short circuit of load
- Over temperature
- Over voltage
- Lightning protection by varistor
- Open circuit battery
- Reverse current at night

Technical data



Solar Charge Controller	Power Tarom 2070	Power Tarom 2140	Power Tarom 4055	Power Tarom 4110	Power Tarom 4140
System voltage	12 V (24 V)		48 V		
Max. input voltage	47 V		82 V		
Max. module input short circuit current	70 A	140 A	55 A	110 A	140 A
Max. load output current	70 A	70 A	55 A	55 A	70 A
Max. self consumption	14 mA				
programable: End of charge voltage (float)	13.7 V (27.4 V)		54.8 V		
programable: Boost charge voltage; 2 h	14.4 V (28.8 V)		57.6 V		
programable: Equalisation charge 2 h (deactivated for gel accu)	14.7 V (29.4 V)		58.8 V		
programable: Reconnection setpoint (SOC/LVR)	> 50 % / 12.6 V (25.2 V)		> 50 % / 50.4 V		
programable: Deep discharge protection (SOC/LVD)	< 30 % / 11.1 V (22.2 V)		< 30 % / 44.4 V		
Ambient temperature allowed	-10 °C...+60 °C				
Terminal size (fine/single wire)	50 mm² / 70 mm²				
Enclosure protection class	IP 65				
Weight	10 kg				
Dimensions l x w x h (l) x 330 x 157 mm	330 mm	360 mm	330 mm	360 mm	360 mm

Technical data at 25 °C / 77 °F

Power class
55 A - 140 A

Displays
- Two line LCD on front door showing SOC, Vbat, all currents, Ah, alarms, charging procedure

Certificates
- Listed for Worldbank funded projects in Nepal
- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Steca PA Tarcom

Data Logger

Steca's data logger PA Tarcom is connected to the RJ45 data loop of the Tarom or Power Tarom charge controller or via the PA HS200 shunt. It is available in different versions as a simple RS232 serial interface (PA Tarcom 01) to log and read out data directly to a PC or laptop, as a data logger connected with integrated analogue modem (PA Tarcom RM), as a data logger with an optional telephone link for phone calls (PA Tarcom RMT) and as a datalogger with a built-in GSM modem for remote monitoring (PA Tarcom GSM). The PA Tarcom data logger is shipped with software.

Features

- 4 years maximum storage capacity (1 MByte)
- Adjustable logging frequency (2… 256 minutes)
- Loggs eight different parameters and relative time
- Field adjustable setting of eight different alarms
- Optional internet services for worldwide access

Interfaces

- Two RJ45 cable sockets
- RS232 serial interface
- Analogue sensor input 0…150 mV for radiation e. g. wind speed
- Potential free alarm contact by opto coupler (50 V, 50 mA)

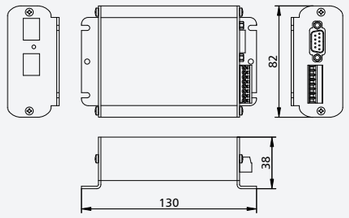
Displays

- Connected to charge controller = flashing green LED
- Data transmission = green LED

Certificates

- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

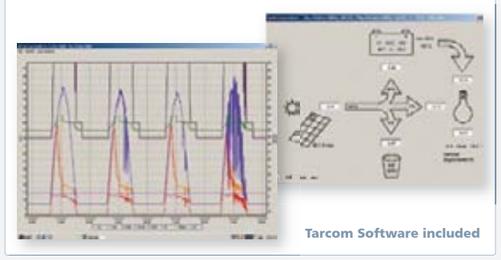
Technical data



Data Logger	PA Tarcom 01 (Serial)	PA Tarcom RM / RMT (Modem)	PA Tarcom GSM	PA Tarcom Ethernet
System voltage	12 V / 24 V / 48 V			
Operating voltage	8 V - 65 V			
Logger capacity	1 Mbit = 2 min. (11 days) à 4:00 h (4 years)			
Max. own consumption	< 10 mA			30 mA
Recorded values	relative time, total charge current, battery current, solar module current, load current, SOC, battery voltage, system status, analog sensor			
System status information	night, overload, load disconnect, overvoltage, low voltage, over temperature, no module			
Data transmission	RS232	analog modem	gsm modem	ethernet
Configurable analog auxiliary input	0 mV - 150 mV			
Alarm output	for all recorded parameters programmable			
Weight	150 g			
Dimensions l x w x h	130 x 82 x 38 mm			

Technical data at 25 °C / 77 °F

SHS VPS COM RV REMOTE HYBRID



Software Tarcom

- Download the data from the logger to a PC
- List of data sets can be exported to MS-EXCEL
- Data sets are shown as graph (values in time series)
- Analyzes energy flows (Ah) within a PV hybrid system
- Activation and selection of alarms
- Configurates modem
- Sets telephone number to call
- Links charge controller to website www.tarcomonline.de
- Tells the data logger at what time he has to call

Steca PA HS200

Shunt

All currents which run through the Tarom and Power Tarom charge controllers are measured for an accurate calculation of the battery's state of charge. However there are currents which the charge controllers do not measure like inverters which are connected directly to the battery or back up generators which feed their energy directly into the battery. The PA HS200 shunt measures these currents through the "hall" effect and transmits them digitally to the Tarom controllers.

Features

- Works on 12 V, 24 V and 48 V voltage level
- Pp to 200 A measurement capacity
- Potential free current measurement
- Communicates and stores data in the PA Tarcom
- Built-in "hall" sensor

Interfaces

- Two RJ45 cable sockets

Operation modes

- "battery": measures currents which run through the battery cable
- "load": measures currents of external loads not connected to the charge controller
- "charge": measures currents of back up generators

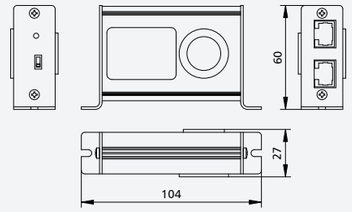
Displays

- 1 LED: connected to charge controller = flashing green LED
- Data transmission = green LED
- Uses Tarom controller's LCD to display values

Certificates

- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Technical data



Shunt for (Power-)Tarom	PA HS200
System voltage	10...65 V
Consumption during standby	< 9 mA
Current range "battery mode"	+/-200 A
Current range "charge mode"	0...+200 A
Current range "load mode"	-200...0 A
Measurement accuracy -20 ... +20 A	+/-1 %
Measurement accuracy -200 ... +200 A	+/-3 %
Sensor	magnetic hall effect
Ambient temperature allowed	-15 °C...+50 °C
Max. admissable humidity allowed	75 %
Enclosure protection class	IP 22
Weight	120 g
Dimensions l x w x h	100 x 60 x 25 mm
Max. diameter for battery cable	19 mm

Technical data at 25 °C / 77 °F

SHS VPS COM RV HYBRID 10 kW SOC

Steca PA 15

Remote Control

Tarom and Power Tarom charge controllers send out signals (125 kHz on 300 baud) which are modulated on the DC power line and received by Steca PA 15 remote control. These signals are information on the state of charge (SOC) of the battery. No additional cabling is required. The PA 15 has five different operation modes adjustable by five different jumper positions. The limited switching capacity of 15 A can be increased by an optional Steca PA EV200 DC relay up to 200 A.

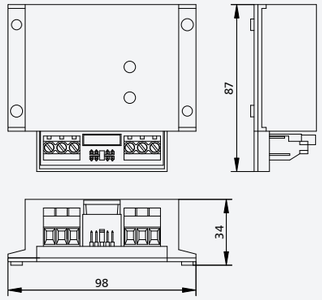
Features

- Receives information on SOC and time (day/night)
- Two field adjustable SOC thresholds
- High reliability by electronic mosfet switch
- Connects a maximum of 9 solar arrays in parallel
- Optional manual load disconnect connected to terminal “S”

Operation modes

- Automatic start/stop of diesel or wind back up generators
- If battery is full the excess energy production is switched over to additional loads e. g. water pump, water heater
- Load control by priority
- Load only operates by night
- Acoustic prewarning before load disconnect

Technical data



Remote control for Tarom series	PA 15
Power supply	10.5 V...60 V DC, 5 mA
Max. current allowed	15 A ; 10 A at 40 °C; 100 A pulse < 10 µS
Overload protection	by 15 A fuse
Wrong polarity protection	fuse
Data transmission	300 Baud
Transmission frequency	125 kHz signal frequency, 450 kHz intermediate frequency
Ambient temperature allowed	-10 °C...+50 °C
Terminal size (fine / single wire)	2.5 mm² / 4 mm²
Enclosure protection class	IP 22
Weight	110 g
Dimensions l x w x h	87 x 98 x 34 mm

Technical data at 25 °C / 77 °F

SHS | VPS | COM | RV | REMOTE | HYBRID | 720 W | SOC | Night

Electronic Protections

- Switches off load if there is no signal
- 15 A fuse against reverse polarity of load and battery
- Wrong grounding
- Overcurrent

Certificates

- Conform to European Standards (CE)
- Made in Germany
- Manufactured in a DIN EN ISO 9001:2000 and DIN EN ISO 14001 facility

Steca PA EV200 DC

Relay

Relay PA EV200 DC	Typ A	Typ B
System voltage	12 V / 24 V	36 V / 48 V
Coil voltage	9 V bis 36 V	32 V bis 95 V
Continuous current carry, max.	200 A	200 A
Mechanical life	1 million cycles	
Contact resistance	0.1 - 0.3 mΩ	
Temperature range	-40 °C...+85 °C	
Weight, nominal	0.43 kg	
Dimensions l x w x h	63 x 80 x 72	

10 kW

Steca Solsum VC

Voltage Converter

Especially solar home systems of 12 V or 24 V require smaller voltages to supply loads as radios, cassette recorders or mobile phones. The Solsum Voltage converter is designed for supplying a large range of consumer electronics with capacities below 1.5 A and voltages below 12 V.

Features

- Five field adjustable output voltages from 3 V to 12 V by jumper
- High input voltage range from 5 V to 30 V
- Screw terminals allow universal use
- Low own consumption

Electronic Protections

- Overtemperature protection
- Overload protection
- Polarity reversal of battery
- Short circuit protection

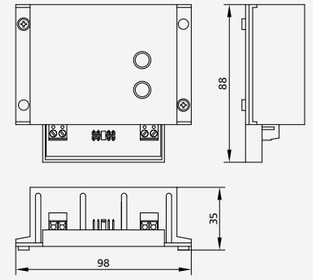
Displays

- LED 1: green - PV system LED; shows if voltage converter is operating
- LED 2: red - alarm LED; wrong polarity

Certificates

- Conform to European Standards (CE)
- Manufactured in a ISO 9001 facility

Technical data

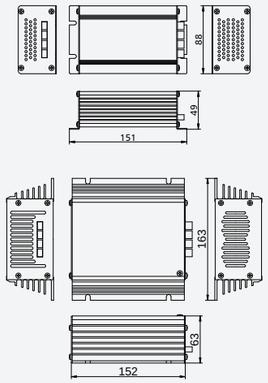


Voltage Converter						
Input voltage	5 V - 30 V[1]	1) The input voltage has to be at least 2 V higher than the output voltage.				
Output voltages	3 V; 6 V; 7.5 V; 9 V; 12 V	2) The max. current depends on the input and output voltage.				
Max. own consumption	2 mA (Ue = 12 V)					
Output current	< 1500 mA[2]					
Max. power loss	9 W					
Terminal size (fine/single wire)	2.5 mm²					
Weight	50 g					
Dimensions	98 x 88 x 35					
Output voltage		3 V	6 V	7.5 V	9 V	12 V
Input voltage	12 V	1000 mA	1500 mA	1500 mA	1500 mA	1500 mA[1]
	24 V	400 mA	500 mA	500 mA	600 mA	700 mA

Technical data at 25 °C / 77 °F

SHS | COM | RV | 18 W

Technical data



MDC / MDCI

DC-DC Voltage Converter

These high end DC-DC converters can be used if the DC output voltage of a photovoltaic system does not fit to the needs of the load. Since most low-voltage equipment, such as lights, multimedia equipment, radio communication equipment or mobile telephones, are designed for 12 V, the different converter types deliver a stable 12 V supply. If for example a 12 V DC energy saving lamp is used in a 24 V or a 48 V system a suitable DC-DC converter must be connected in between the load output of the charge controller and the 12 V energy saving lamp.
The MDC and MDCI converters are optimally designed for the use in photovoltaic applications. The types with 13.6 V output voltage can also be used as a battery charger for a 12 V~accessory battery in an otherwise 24 V system.
For security reasons the MDCI series is electrically isolated in order to protect the load. But even the converters of the MDC series can withstand high voltage spikes at the input (load dump) and therefore protect your appliances at the output against damaging overvoltage.

Features

- Great variety of different input voltages
- Output for 12 V or 24 V loads
- Maximum power 360 W
- Efficiency of up to 90 %
- Best reliability

Electronic Protections

- Short circuit protection by current limitation
- Overload protection by current limitation
- Over-temperature protection by current limitation
- Reverse input polarity protection

Certificates

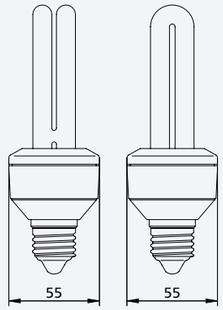
- Conform to European Standards (CE)

DC-DC Converter	MDC 2412-5	MDC 2412-8	MDC 2412-12	MDC 2412-20	MDC 2412-30	MDC 1224-7	MDCI 100	MDCI 200	MDCI 360
Input voltage	20-32 V					10-18 V	9-18 / 20-35 / 30-60 / 60-120 V		
Output voltage	13.6 V					24 V	12.5 / 24 V		
Max. output current	5 A	8 A	12 A	20 A	30 A	7 A	8 / 4 A	16 / 8 A	29 / 15 A
Nominal power	70 W	110 W	165 W	270 W	410 W	170 W	100 W	200 W	360 W
Efficiency max.	90 %						85 %		
Galvanic isolation	no						yes		
Cooling	convection				fan	convection	convection	fan	
Ambient temp. allowed	-10 °C ... +40 °C						-20 °C ... +45 °C		
Weight	0.2 kg	0.2 kg	0.3 kg	0.5 kg	0.6 kg	0.5 kg	0.5 kg	0.6 kg	1.4 kg
Dimensions l x w x h	55 x 88 x 49 mm	85 x 88 x 49 mm		115 x 88 x 49 mm	125 x 88 x 49 mm	115 x 88 x 49 mm	151 x 88 x 49 mm	182 x 88 x 49 mm	152 x 163 x 63 mm

Technical data at 25 °C / 77 °F

SHS VPS COM RV 360 W

Technical data



ESL 11 ESL 7

Steca Solsum ESL

5 W, 7 W, 11 W / 12 V Energy Saving Lamp

Steca designed and recently improved the electronic ballast of the 12 V DC compact fluorescent lamp (CFL). Preheating, high electronic efficiency and low thermal losses increase the lifetime of the CFL to more than 100.000 on/off switching cycles. The Steca CFLs show much higher lumen efficiencies (lm/W) compared to LED or incandescent lamps.

Features

- Brightness of 11 W CFL is comparable with a 60 W incandescent bulb
- Saves up to 80 % of energy compared to an incandescent bulb
- High reliabilty of more than 100.000 on/off switching cycles
- Easy to install by a E27 or bayonet socket
- Several years of operation in the field
- Compact and robust product design

Certificates

- Conform to European Standards (CE)
- Listed for Worldbank funded projects in China, Sri Lanka
- Developed in Germany
- Manufactured in an ISO 9001 facility

Steca Energy Saving Lamp	ESL 5	ESL 7	ESL 11
Nominal current at 12 V	420 mA	580 mA	920 mA
Nominal voltage	12 V		
Input voltage	10 V - 15 V		
Nominal power	5 W	7 W	11 W
Luminus flux	250 Lm	370 Lm	650 Lm
Luminus efficiency	50 lm/W	52 lm/W	60 lm/W
Life span (min.)	9.000 h		
Switching cycles	100.000		
Ambient temperature allowed	-20 °C ... +50 °C		
Dimensions l x w	123 x 55 mm	133 x 55 mm	163 x 55 mm
Weight	125 g		135 g
Socket	E27/Bayonet		
Light colour	cool white (6400K) / warm white (2700K)		

Technical data at 25 °C / 77 °F

SHS COM RV

Steca PF 166

Solar freezer

The Steca PF166 is the most energy saving DC fridge and freezer combination for all DC and solar applications, also for medical clinics and medicine cooling. The device can be used either as a fridge or as a freezer. The user can also fully programme the unit and adjust the temperature inside the cooling compartment individually.

Due to the latest A++ cooling technology in combination with optimised electronic regulation and compressor speed control Steca provides optimal use of energy. This leads to cost savings as the size of the necessary PV off-grid system can be reduced in comparison to other DC fridges.

User friendliness, highest quality, reliability and maintenance free long life time are important characteristics of this innovative product. The device can either run with 12 V or 24 V input voltage.

Features

- A++ cooling technology
- Lockable lid
- Compressor speed control
- Automatic selection of 12 V / 24 V
- Temperature fully programmable
- Fridge or freezer in one cabinet
- Applicable for all DC applications

Display

- User friendly display
- Digital temperature display

Protection

- Wrong polarity protection
- Low voltage disconnection (lvd)
- Power breakdown display
- Automatic reconnection after LVD
- Temperature alarm

Special features

- Unit runs on a single 70 W module in most climates
- Fast cooling due to compressor speed control
- Low maintenance and easy to clean

Technical data

Steca PF166		
System voltage	12 V	24 V
Energy efficiency class	A++	
Cooling method	compressor	
Energy optimised speed control	yes	
Full digital and electronic control system	yes	
Configurable	yes	
Usable cooling volume	166 liters (5,9 ft³)	
Input voltage range	10 V to 17 V	17 V to 31.5 V
Deep discharge protection	10.4 V	22.8 V
Automatic switch-on threshold	11.7 V	24.2 V
Max. power consumption	40 - 100 W	
Recommended fuses	15 A	7.5 A
Refrigerator or freezer function	adjustable	
Adjustable internal temperature	yes	
Refrigerator temperature range	2 °C | 35.6 °F – 12 °C | 53.6 °F	
Freezer temperature range	-20 °C | -4 °F – -10 °C | 14 °F	
Ambient temperature range	10 °C | 50 °F – 43 °C | 109 °F	
Display	digital temperature display in lid	
Hanging baskets	2	
Freezer trays	3	
Lock	yes	
Cold battery	1	
Celsius/Fahrenheit temperature display	adjustable	
Display brightness	adjustable	
Automatic energy-saving mode	yes	
WHO Certificate	no	
External dimensions h x w x d	91.7 x 87.2 x 70.9 cm 36.1 x 34.33 x 27.91 inch	
Weight	61 kg | 134 lbs	

Technical data at 25 °C / 77 °F

Certificates

- Conform to European Standards (CE)
- Proved for solar applications
- Made in EU ISO 9001 and 14001 facility
- CFC-free (R-134a)
- RoHS Compliant

Steca fuel cells

Efoy 600, 1200, 1600

The Efoy fuel cells are direct methanol fuel cells (DMFC), which can run in combination with a battery.

The fuel cells can be fully integrated into a Steca hybrid system as a reserve generator. In case of extra energy demand, the fuel cell is automatically started and the battery is charged. The cell is delivered together with the fuel tank, and can be connected directly to a 12 V battery. It is designed for small systems which require their energy supply to be extremely reliable.

Functions

- Easy to integrate into a Steca hybrid system
- Plug & play solution
- Liquid tank for methanol allows fuel to be managed easily

Display

- LEDs to display system status
- Displays the Ah fault messages and the charging process

Certificates

- Conform to European Standards (CE)
- Made in Germany

Technical data

Fuel cell	Efoy 600	Efoy 1200	Efoy 1600
Charge capacity	600 Wh/day 50 Ah/day	1,200 Wh/day 100 Ah/day	1,600 Wh/day 130 Ah/day
Grid voltage[1,]	12 V		
Rated output	25 W	50 W	65 W
Rated current	2.1 A	4.2 A	5.4 A
Methanol consumption	1.1 l/kWh; 1.3 l/100 Ah		
Noise level	23 [2,] | 39 [3,] dB [A]		
Weight	7.3 kg	7.5 kg	7.6 kg
Operating temperature	-20 °C (-4 °F) ... +40 °C (104 °F)		
Dimensions l x w	43.5 x 20.0 x 27.6 cm		
Recommended batteries	12 V lead batteries (lead acid or lead gel) with 40 to 200 Ah capacity		

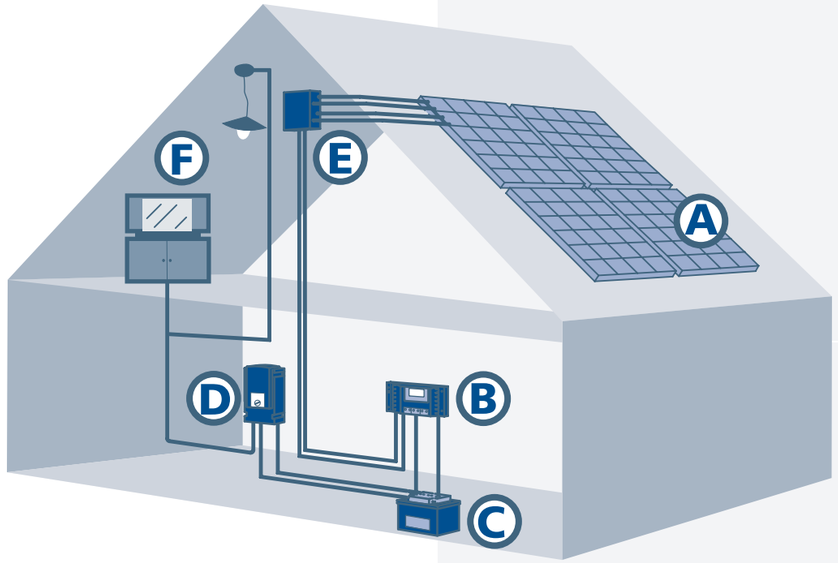
[1,] 24 V devices available on request.
[2,] at a distance of 7 m
[3,] at a distance of 1 m

Technical data at 25 °C / 77 °F

Tank cartridge	M5	M10
Volume	5 litres	10 litres
Weight	4.3 kg	8.4 kg
Dimensions l x w x h	190 x 145 x 283 mm	230 x 193 x 318 mm
Capacity	4.5 kWh 380 Ah at 12 V 190 Ah at 24 V	9.1 kWh 760 Ah at 12 V 380 Ah at 24 V

Tank cartidges in other dimensions available on request.

Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com



Legend:

A Generator
B Solar charge controller
C Battery
D Inverter
E Generator clamps
F Current consumer (230 V~)

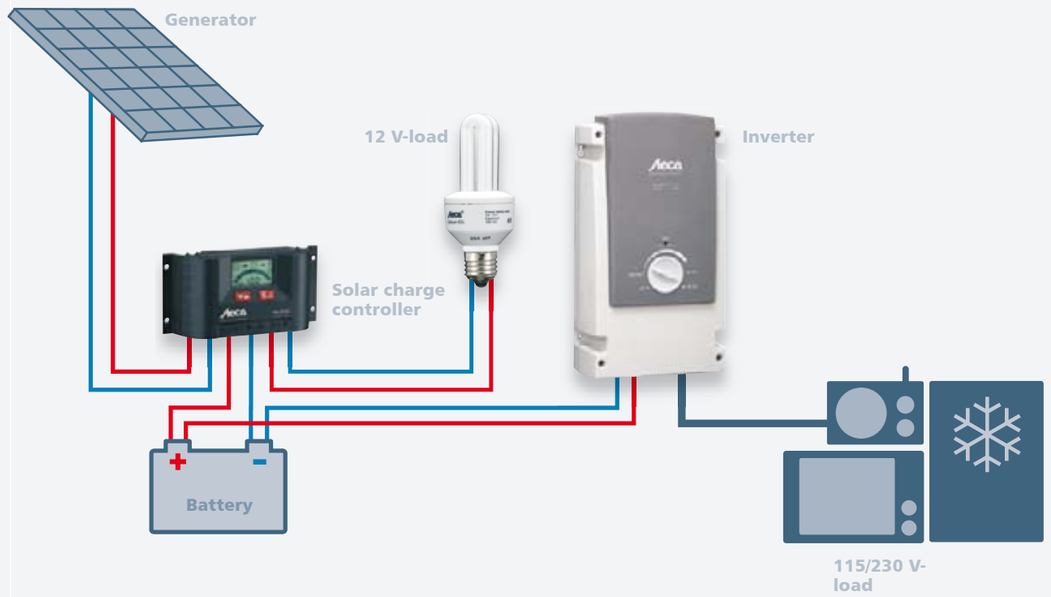
PV Battery Systems

with Steca inverters.

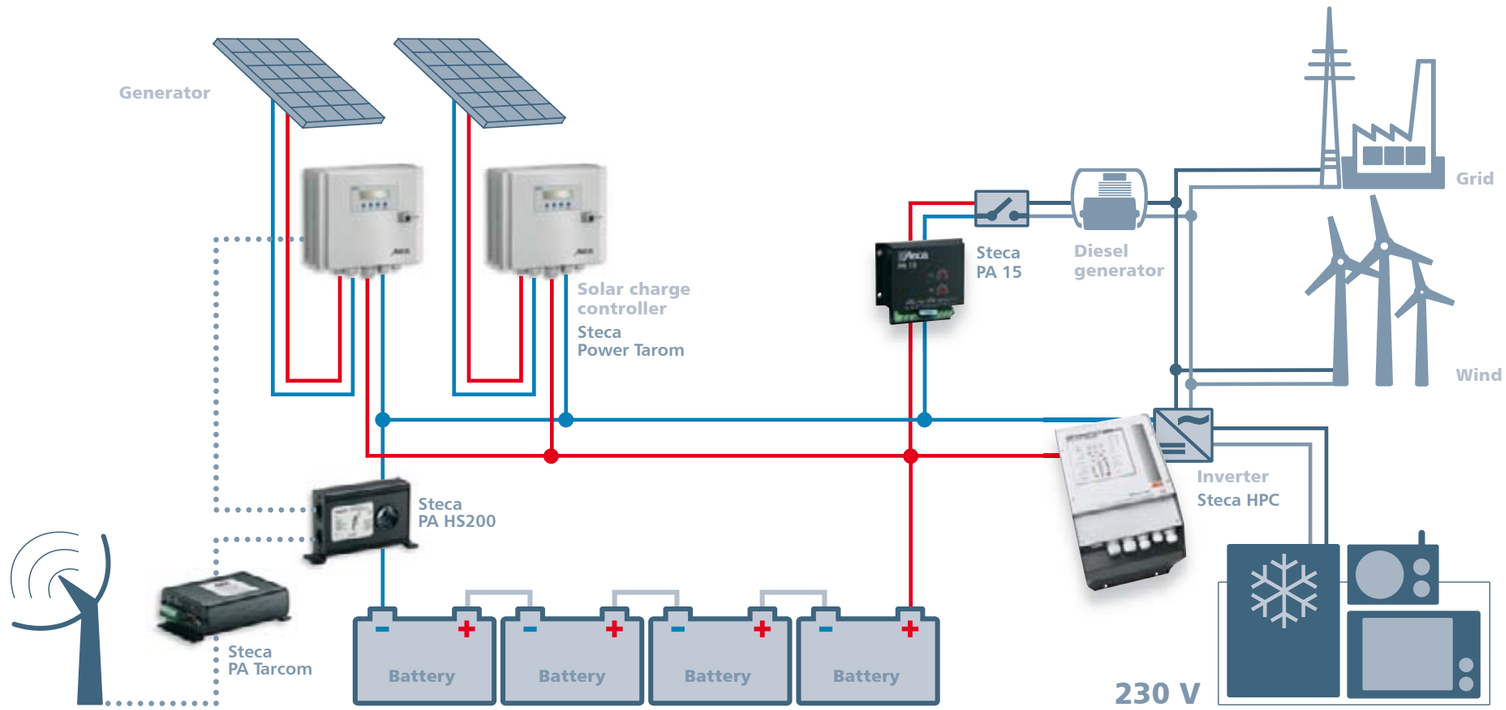
In contrast to solar home systems, stand-alone systems are equipped with an extra inverter.

This extra inverter changes the direct current of the battery into alternating current. This means that any common AC appliances can be used - just like with the public grid. However, DC appliances can also be connected to the output of the charge controller.

The inverter is connected directly to the battery, using a cable which is as short and as fat as possible. An AC system can be created with a system or battery voltage of 12 V, and also with 24 V or 48 V for greater capacities. This concept makes installation quick and easy.



Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com



The proper inverters for single-phase Steca hybrid systems are inverters with integrated battery charger:

– Steca XPC,
– Steca Compact,
– Steca HPC and
– Steca Xtender.

Possible connected loads are from 1.4 kW at 12 V up to 24 kW at 48 V.

Hybrid Systems

The main feature of a hybrid system is the use of two or more different electricity sources.

Among solar energy, photovoltaic hybrid systems generally employ a diesel generator, a wind turbine or the public grid as a further electricity source. The inverters used in hybrid systems, which have integrated battery chargers, supply the connected AC appliances according to demand from the battery bank, solar energy or the second electricity source. These devices also allow the batteries to be recharged from the extra energy source.

Photovoltaic hybrid systems offer the advantage that the solar generator does not have to be significantly oversized for periods of low sunlight. This avoids substantial costs. When selecting its energy source, the system always gives priority to the energy provided by the module. In combination with a controllable second source, the energy supply remains reliable and available 24 hours a day, all year round.

Single-phase hybrid system concept

The central, intelligent element within the system is the Steca Tarom or Power Tarom solar charge controller. The energy flow is controlled by this device, and the battery is protected from critical states. The Tarom/Power Tarom is directly connected to the battery.

Also connected to the battery is the DC bus. Using a shunt, the Steca PA HS200, which is situated on the minus cable attached to the battery, the battery current is measured and this information is passed on to the Tarom/Power Tarom. Further components, such as an inverter or the Steca PA 15 remote control, are directly connected to the DC bus. In order to automatically start a diesel generator if the battery's state of charge (SOC) falls below an adjustable threshold, the output of the PA 15 is connected to a relay. In turn, the normally open contact of the relay switches the diesel generator on, and subsequently switches it off again.

The Tarom/Power Tarom controls the DC hybrid system. The PA HS200 current sensor transfers all information on the charge and discharge currents at the DC bus to the Tarom/Power Tarom. With the aid of this data, the controller is able to calculate the current charge status of the battery. This information is transferred via the DC cabling (powerline modulation) to all connected Steca PA 15s. Every PA 15 can be independently configured to a certain switch-on and switch-off threshold of the charge status.

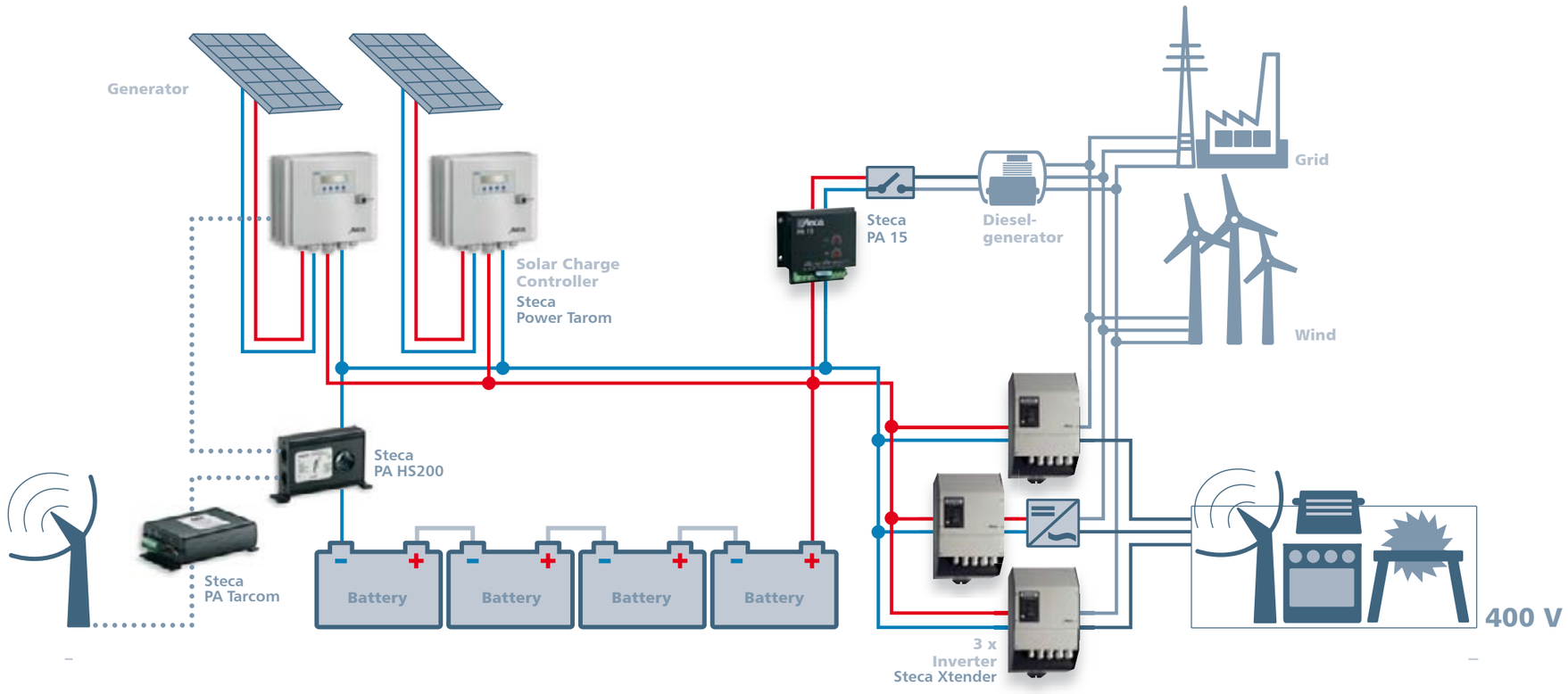
If, in the above example, the inverter is discharging the battery, then this information is transferred to the Tarom/Power Tarom, which calculates the charge status. As soon as the charge status falls below the appointed threshold value of the connected PA 15 (e.g. 30 %), the controller switches on the diesel generator via a relay. The load is now being supplied from the generator, and at the same time the battery is being recharged. After the charge status has reached the PA 15's appointed upper value (e.g. 90 %), the diesel generator is switched off again.

In order to create an automatic energy management system, the AC output of the diesel generator is connected to the AC input of the inverter with integrated battery charger. The load is always connected to the output of the inverter. If the diesel generator is running, and this current flows to the inverter, then the inverter automatically switches to transfer mode. The loads are supplied from the diesel generator whilst the battery recharges via the inverter. If the AC output voltage of the diesel generator falls under a certain voltage level, which can be adjusted on the inverter, then battery operation is automatically switched back on.

This system allows automatic energy management which gets optimum use from the available solar energy, maintains the batteries reliably, and ensures electricity supply around the clock.

Important features

- Combination of different power sources like PV, wind, diesel generators, etc.
- 24 h / d full 230 V~ power supply
- 12 V / 24 V or 48 V overall DC-bus
- Automatic energy management regulation based on the State of Charge of the battery. Including automatic start of controllable power sources like e. g. diesel generators
- Optimised battery charging algorithm
- Data logger function with automatic alarm



Three-phase hybrid system concept

The control concept is similar to that of the single-phase system. If more than one Tarom/Power Tarom are employed, one of the devices must be designated as the master Tarom. All other charge controllers are then automatically designated as slave Taroms. The master Tarom/Power Tarom is connected directly to the battery, whilst all slaves are connected to the DC bus. Only the master Tarom/Power Tarom shows the correct charge status on its display and controls the energy flow around the system. Slave Taroms/Power Taroms perform the function of controlling the charging from the connected PV modules.

In order to assemble a three-phase energy supply, three inverters are connected to the DC bus. To allow three-phase operation the inverters must be specially designed. Various three-phase generators can be connected to the three inverters for controlled recharging of the battery via a PA 15 and a relay. These may be wind, water, or diesel generators, or the public grid. Suitable inverters with integrated battery chargers in three-phase mode are the Steca Xtender devices, which can be employed from 12 V/3 kW to 48 V/24 kW per phase. In total, a maximum of 72 kW can be supplied.

Both single-phase and three-phase hybrid system concepts are based on the same principles of energy management. With the help of the Steca PA HS200 current sensor, the charge and discharge currents of the components, such as slave Taroms/Power Taroms, inverters, etc., are determined and communicated to the master Tarom/Power Tarom. Based on the calculated charge status of the battery, the Steca PA 15 switches the extra generator on or off. The three single-phase inverters switch off if the voltage falls below a given threshold to protect the battery from deep discharge.

Important features

- Combination of different power sources like PV, wind, diesel generators, etc.
- 24 h / d full 3 phase 400 V~ and single phase 230 V~ power supply
- 12 V / 24 V or 48 V overall DC-bus
- Automatic energy management regulation based on the State of Charge of the battery. Including automatic start of controllable power sources like e. g. diesel generators
- Optimised battery charging algorithm

General Recommendations

for Inverters and Hybrid Systems

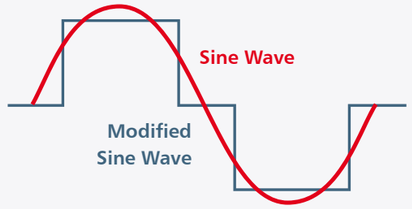
Inverter selection

The inverter should be sized properly depending on the type of application. The summary of consumption should be covered by the continuous power of the inverter while starting currents should be within the maximal power.

To allow a future increase of consumption Steca recommends to oversize the inverter.

Sine Wave Inverters

In contrast to modified sine wave inverters, the Steca sine wave inverters supply a pure and accurate regulated sine wave to the load. Only this pure sine wave technology allows the user to run all types of AC loads within the off-grid photovoltaic system, which can normally be used in grid connected mains power supply systems. Additionally, this technology guarantees a noiseless operation, which is especially important if critical applications like radios, television and other sensitive devices are used.



PV generator and charge controller selection

The solar module array has to be adapted to the local solar irradiation conditions and the energy consumption of the system. To avoid downtimes, the PV generator must provide enough energy even during months with low irradiance to meet the needs of the loads.

The minimum size of the regulator had to cover the maximum short circuit current of the module and the maximum load current. Sometimes even technical feature had to be supported in the application and a high end regulator should be used in a low power system.

To keep the initial cost on a low level we recommend to size modules and battery according to the current consumption and to size the controller corresponding to future refitting.

Battery rating

The battery has to be sized properly in order to enable the inverter also to supply high demanding loads. Some critical loads like fridges, freezers, pumps and motors draw extremely high currents during a short starting phase. To run such loads it is important to use a capable inverter with an extremely high overload capacity especially during the starting phase. The battery also has to be sized in a proper way to be able to supply enough current if requested by the inverter. The following formula recommends how to size the battery: the batteries capacity should be at least 5 times more than the nominal power of the inverter divided by the nominal voltage of the battery

$C_{batt} \geq 5\ h * P_{nom} / U_{nom}$

while Pnom indicates the nominal power of the inverter in Watt and Unom the nominal voltage of the battery in Volt.

Pnom_inverter	Unom_battery	Battery capacity
200 W	12 V	> 100 Ah
500 W	12 V	> 200 Ah
1,000 W	12 V	> 400 Ah
2,000 W	12 V	> 800 Ah
2,000 W	24 V	> 400 Ah
3,500 W	24 V	> 700 Ah
3,500 W	48 V	> 350 Ah
5,000 W	48 V	> 500 Ah
7,000 W	48 V	> 700 Ah

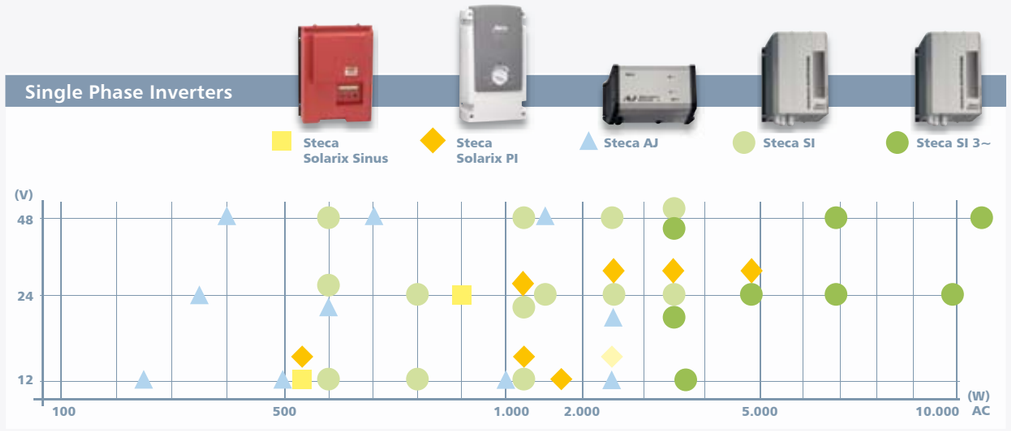
Selection of system voltage

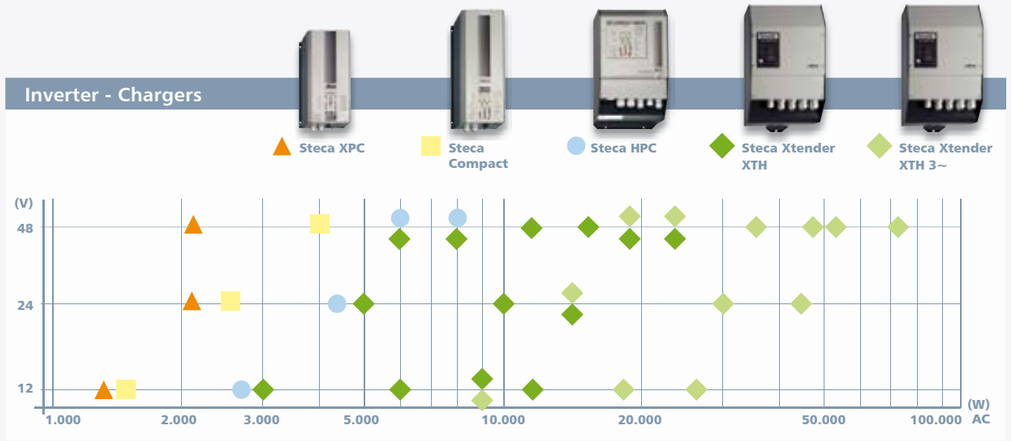
The system voltage of the off-grid photovoltaic system should be selected dependently of the load demand. The higher the load demand the higher the system voltage. If no 12 V DC loads are connected, a higher system voltage of 24 V or 48 V should be preferred to reduce the DC-current in the system. Above around 2500 W, only inverters with 48 V power systems can be recommended. The higher the voltage, the lower the system currents. Finally, lower currents result in higher system efficiency due to less losses.

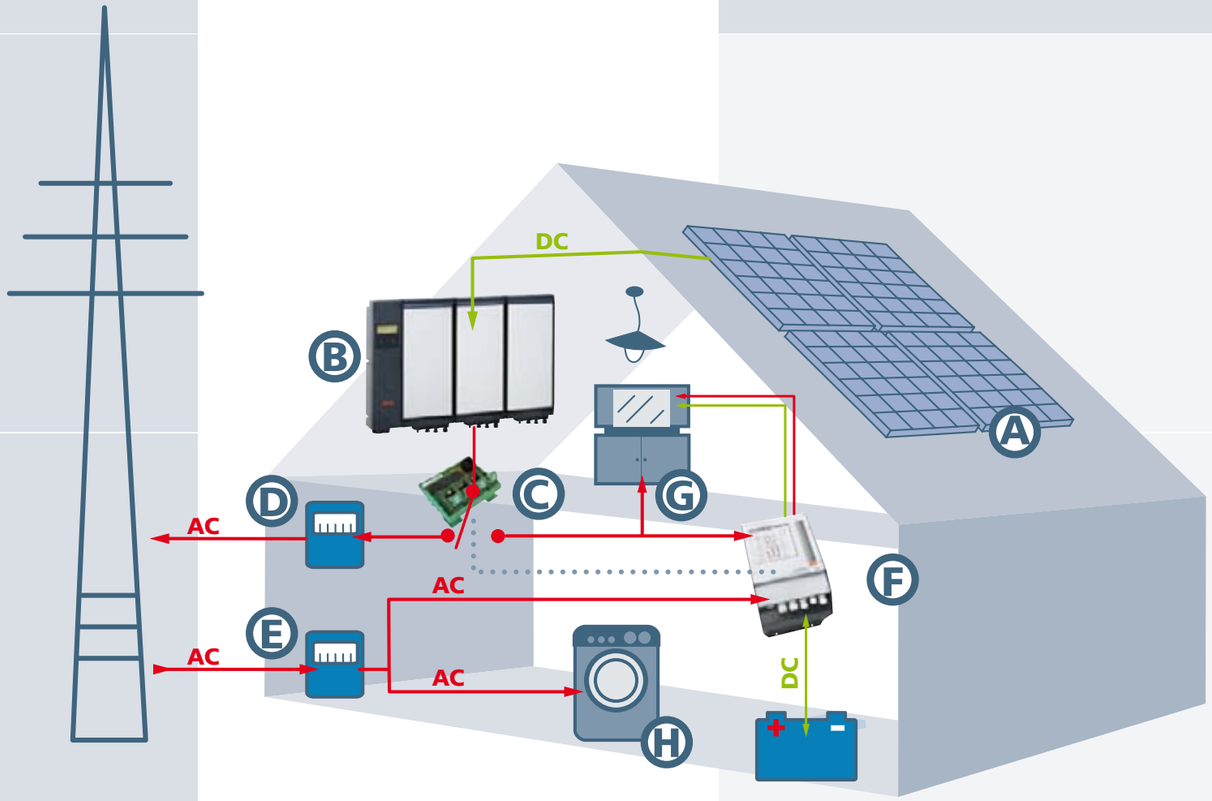
Selection of cables

DC currents are typically high in inverter systems. Due to this fact, it is essential to use proper cables between the inverter and the battery. Always connect the inverter directly to the battery. Choose a DC inverter cable as short as possible. Also, the thickness of the cable should be sized properly. Choose a thicker cable in case of doubt – this can have a significant influence to the overall system behaviour. By using thick and short cables the system losses can be reduced – the results are higher efficiency and better performance. If the inverter is delivered with a DC cable never enlarge this cable or use a thinner one.

Inverter Selection Matrix







Steca Solsafe

Blackout - and there is still a light!

Large-scale power supply failures become more and more frequently. With emergency systems such as generators or uninterruptible power supplies (UPS), the power supply can be assured for a certain time.

In case of a power outage, the grid-connected PV system also stops working. This means that although power may be available, it cannot be used. The SOLSAFE system offers a simple, efficient and cost-effective solution to this problem.

Installing one of our combined inverters Steca XPC, Compact, HPC or Xtender with the supplementary ARM-01 module and a battery system turns any grid-connected PV system into an emergency power supply in the event of a power outage. If the public grid is available, the electrical output generated by the solar modules is fed directly into the grid by the StecaGrid inverter (B) and the feed meter (D). In parallel to this, the unsupplied loads (H) receive power directly from the grid, via the consumption meter (E). The batteries are kept fully charged from the public grid via the Steca hybrid inverter system (F) and recharged if necessary. Furthermore, the supplied loads (G) receive power from the public grid during transfer mode.

Legend:

A Solar modules
B Grid-connected inverter
StecaGrid 2000+
C ARM-01 option
D Grid-feed electricity meter
Consumption electricity meter
F Steca XPC,
Steca HPC or Steca Compact stand-alone inverter
G Supplied loads
H Unsupplied loads

If there is a grid outage, the Steca hybrid inverter system automatically switches to the mode of operation as a stand-alone inverter, and continues to feed power to the supplied loads (G) without any interruption. Because the StecaGrid grid-feed inverter can no longer supply power to the grid, its output is channelled directly to the supplied loads (G) by the ARM-01 switch (C). In this way, the loads can receive power directly from the grid inverter of the solar modules. At the same time, the battery can be recharged with the available solar energy longer. The supplied loads can receive power during the night.

With this set-up, the capacity of the battery can be kept small, allowing for an optimal design of system costs.

The SOLSAFE system is fully automatic and can be integrated into any new or existing PV system.

SOLSAFE ensures the power supply, and furthermore allows the solar energy to be fully utilised.

Why choose Steca Solsafe?

- It allows a great system flexibility.
- The grid inverter is designed according to the PV generator, and the „stand-alone inverter" according to the desired emergency power supply.
- The PV system's output and operating voltage can be freely selected, and do not depend on the size and battery voltage of the emergency power supply. Please notice that the AC output of the grid-feed inverter may never be greater than the rated output of the stand-alone inverter.
- The PV voltage of the grid inverter does not depend on the battery voltage.
- Existing grid-connected solar power systems can be fitted with „Steca Solsafe" without alterations of any kind.
- The available PV capacity is added to that of the „stand-alone inverter" in the event of a power outage, or the solar power is stored in the battery.
- It can be installed into any existing system without problems.

Stand-alone inverters

Steca XPC
1400-12, 2200-24, 2200-48

Functions
- Performance category: 1,400-2,200 W
- Adjustable integrated battery charger
- Adjustable, automatic load detection
- Can be used as a backup systemor UPS
- Multifunction contact

▶ Page 59

Steca Compact
1600-12, 2600-24, 4000-48

Functions
- Performance category: 1,600-4,000 W
- Adjustable integrated battery charger
- Excellent overload behaviour
- Adjustable, automatic load detection
- Can be used as a backup system or UPS
- Adjustable power distribution
- Multifunction contact

▶ Page 60

Steca HPC
2800-12, 4400-24, 6000-48, 8000-48

Functions
- Performance category: 2,800-8,000 W
- Adjustable integrated battery charger
- Excellent overload behaviour
- Adjustable, automatic load detection
- Can be used as a backup system or UPS
- Adjustable power distribution
- Multifunction contact

▶ Page 61

Steca Xtender XTH
3000-12, 5000-24, 6000-48, 8000-48

Functions
- Performance category: 3,000-72,000 W
- Adjustable integrated battery charger
- Up to three inverters per phase can be connected in parallel
- Adjustable, automatic load detection
- Can be used as a backup system or UPS
- Three-phase system: 9,000-72,000 W

▶ Page 62

Grid inverters

StecaGrid 300/500
300 W - 3,600 W

Functions
- Flexible and expandable
- Efficiency of up to 95.8%
- MiniString concept
- Low weight
- Simple installation
- Just one StecaGrid Control per system

▶ Page 8

StecaGrid 2000+
2,000 W up to several 10,000 W

Functions
- DualString concept
- Flexible and expandable
- Master-slave concept
- Fanless and maintenance-free
- Efficiency of up to 95.0%
- Informative display
- Low weight
- Simple installation

▶ Page 10

Steca Solarix PI

550, 1100

In developing the Solarix PI stand-alone inverter, Steca has brought about some innovations which are unprecedented in this form. These are, above all, parallel switching, the novel operating concept which uses a single rotary switch, direct communication in order to calculate the state of charge (SOC) with Tarom and Power Tarom, and the electronic fuse. Furthermore, our many years of experience have come into play for deploying these inverters specifically in photovoltaic systems. This shows up, in the way that a most diverse range of appliances is provided with a stable energy supply, whilst the inverter's own consumption remains low.

Functions

- Sine wave inverter with 550 W or 1,100 W
- Inverter can be connected directly to the Steca Tarom
- Good overload capacity
- Optimal battery protection
- Automatic load detection in standby mode
- Up to 4 devices can be connected in parallel

Electronic protection functions

- Battery deep-discharge protection
- Switches off in case of battery overload
- Overheating and overload protection
- Short circuit protection
- Internal fuse provides reverse polarity protection

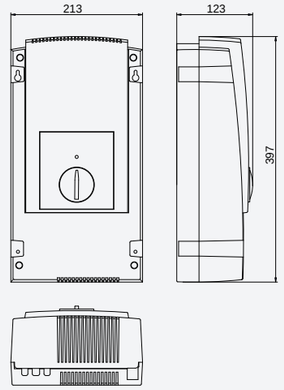
Options

- Available with 115 V / 60 Hz or 230 V / 60 Hz

Displays

- Three-colour LED shows the operating status of the inverter

Technical data



Steca Solarix PI	550	1100
Nominal battery voltage	12 V	24 V
Input voltage range	10.5 - 16 V	21 - 32 V
Output voltage	230 VAC +/- 10%	
Output frequency	50 Hz	
Continuous power	450 VA	900 VA
Max. power 30 min.	550 VA	1,100 VA
Max. power 5 sec.	1,500 VA	3,000 VA
Max. asymmetric load	250 VA	350 VA
Max. efficiency	93 %	
Own consumption standby	0.5 W	
Consumption „ON" at idle mode	4 W	7 W
Cos phi of load	0.1 - 1 (to Pnom)	
Load detection (standby)	yes	
Battery deep discharge protection	current driven or by Tarom	
Over temperature protection	yes	
Electronical protection	Reverse polarity/over voltage/ over current/ socket to 230 V grid	
Cable length battery/ AC	1.5 m / 1.5 m	
Temperature range	-20 °C to +45 °C	
Enclosure protection class	IP 20	
Options	parallel use over PAx4	
Weight	5.5 kg	8.5 kg
Dimensions l x w x h	400 x 215 x 130 mm	

Technical data at 25 °C / 77 °F

Power class
550 W - 4,400 W

0 W | 500 W | 1,000 W | 5,000 W | 10,000 W

SHS VPS COM

Parallel switching

A stand-alone PV system is relatively difficult to size, since the loads and their average running times are often not adequately known, or because more loads are afterwards added.

This is where the simple expandability of the Solarix PI inverters pays off. Up to four devices can be operated in parallel. The connections are made via an external box, the PAx4.

From the outside, the combination of two, three or four inverters functions like one device with a correspondingly higher capacity. Inside only one inverter continues to operate in case of open-circuit operation or low output, e.g. for the lighting. This has a positive effect on the electricity consumption, since the devices which are not turned on do not consume any power. Only when a higher capacity is called for, for example when a refrigerator is turned on, all the inverters are automatically switched on, thus ensuring trouble-free operation.

The Solarix PI inverters are all the same. Only via the connection to the PAx4 parallel switch box one inverter is designated as the master. This device has control over the system, whilst the other Solarix PI inverters operate as slaves.

Rotary switch

Operating the Solarix PI is made very easy by the large rotary switch on the front of the device.

If the Solarix PI is being used as a single device, three different modes of operation are possible, and these may be selected using the rotary switch. The load detection section follows on from the 'off' setting on the far left. In this section, the switch can be turned continuously to match the power consumption of the smallest appliance. In order to reduce power consumption, the inverter is then turned off, and it checks periodically whether an appliance has been turned on. Only in this case the inverter switchs itself on. The 'on' setting on the rotary switch follows on from the load detection section. In this mode of operation, the inverter makes the output voltage continually available.

If several inverters are connected in parallel, the requested mode of operation is selected by using the rotary switch of the device connected to the 'master socket'. In addition to the modes of operation described above, there is also the setting 'all on'. This means that not only the master device is continually switched on, but all other connected inverters as well.

The use of the rotary switch makes it possible to see very quickly the current mode of operation.

Electronic fuse

One innovation in stand-alone inverters is the electronic fuse as it is employed by Steca in solar charge controllers. With this fuse, the Solarix PI is protected against overloads, and also against the accidental connection of the AC output to the public grid. Because the fuse is electronic, it does not need to be replaced after it has been triggered, as is the case with mechanical fuses. As soon as the problem which triggered the fuse has been remedied, the inverter automatically reverts back to its selected mode of operation.

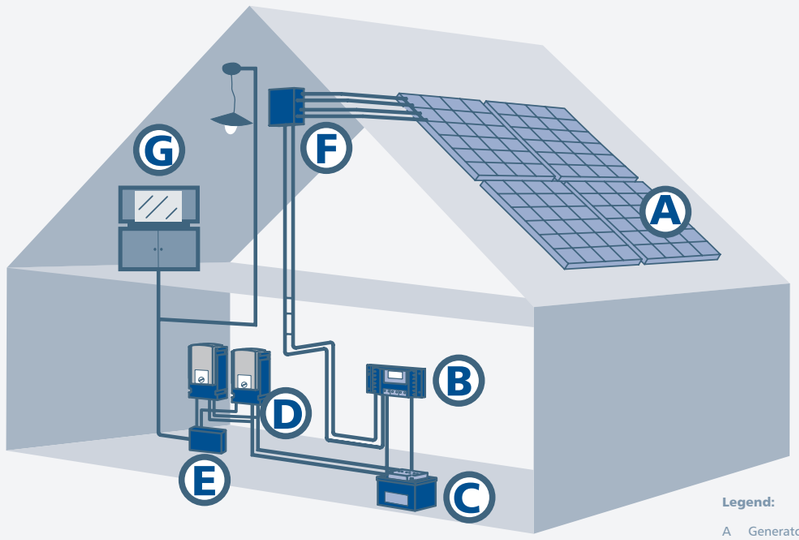
The Solarix PI is also internally protected against an incorrect wiring of the battery. In case of reverse polarity, the device remains undamaged, and there is no need to replace the fuse.

Quick and robust control

The Solarix PI inverter has been developed to supply power to a wide range of appliances. Thanks to the quick control, even critical loads can be operated. At the heart of the controller is a DSP which takes on the extensive calculation work. The inverter's necessary robustness is supplied by a control software program which was developed in cooperation with a renowned research institute.

Low operating consumption

The stand-alone inverter availed of Steca's 15 years of experience in the field of stand-alone PV systems. This is reflected, for instance, in the low operating consumption of the Solarix PI. In solar home systems, the inverter is connected to the battery 24 hours a day. It is designed to consume as little solar-generated energy as possible both in load-detection and open-circuit modes.



Legend:

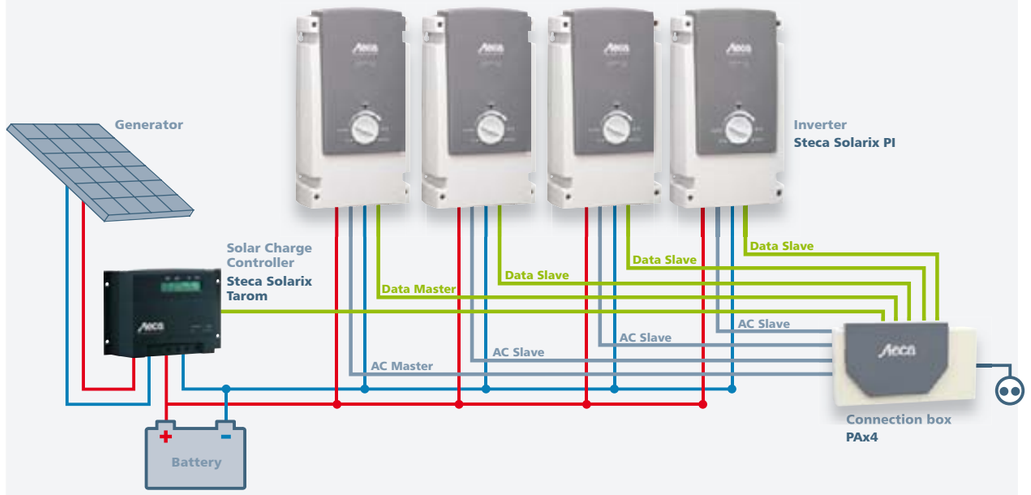
A Generator
B Solar charge controller
C Battery
D Sine wave inverter Steca Solarix PI
E Inverter connection box
F Generator connection box
G Load (230 V~)

Communication with Tarom charge controllers

A further Solarix PI innovation is the communication with the solar charge controllers from the Steca Tarom and PowerTarom series. A data connection to the charge controller can be created via the PAx4.

In this case, the inverter connected directly to the battery communicates the amount of energy that has been withdrawn to the solar charge controller. The controller is thus able to calculate the correct state of charge (SOC). This means that these systems no longer need to be switched to voltage-controlled operation or an additional current shunt.

If the switch-off threshold of 30 % SOC is reached, the Solarix PI receives a signal from the solar charge controller and subsequently switches itself off in order to protect the battery from deep discharge. It turns itself back on again once the SOC has reached the 50 % mark.



Solarix Sinus

550 I, 550 RI, 900 I, 900 RI

The Solarix series of sine wave inverters has proved itself in over 10,000 applications. These devices have been used throughout the world. With its compact construction and optionally integrated solar charge controller, this 'plug & play' solution is easy to install. A switch on the front of the device enables the user to choose between automatic load detection mode, continuous operation or sleep mode, therefore considerably reducing the standby consumption. This is particularly important for stand-alone systems.

Features

- Sine wave inverter with 550 W or 900 W
- Inverter with optional solar charge controller in one device
- High overload capabilities
- Optimum protection of the battery
- Automatic load detection in stand-by mode

Electronic Protections

- Battery deep discharge protection
- Battery over voltage shut down
- Over temperature and overload protection
- Short circuit protection
- Reverse polarity protection by internal fuse

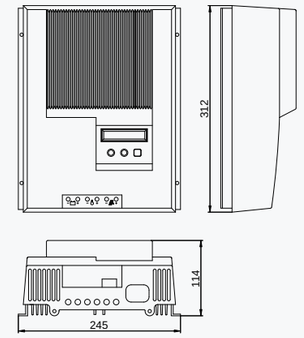
Displays

- Operational status inverter by tricolour LED
- Optional charge regulator shows operational status by additional tricolour LED and 16-digit LCD display

Options

- Types with 115 V / 60 Hz or 220 V / 60 Hz

Technical data



Inverter Solarix Sinus	550 I / 550 RI*	550 I-L60 / 550 RI-L60*	900 I / 900 RI*	900 I-L60
Nominal input voltage	12 V		24 V	
Input voltage range	10.5 - 16 V		21 - 32 V	
Max. module short-circuit current*	25 A*			
Max. DC load current*	15 A*			
Output voltage	220 V~ +/-10 % (true sine wave)	115 V~ +/-10 % (true sine wave)	220 V~ +/-10 % (true sine wave)	115 V~ +/-10 % (true sine wave)
Output frequency	50 Hz +/-0.5 % optional 60 Hz	60 Hz +/-1 %	50 Hz +/-0.5 % optional 60 Hz	60 Hz +/-1 %
Continuous power	550 VA	500 VA	900 VA	900 VA
Max. efficency	91.5 %	91 %	92 %	91.5 %
Own consumption	430 mA / 50 mA / 15 mA (On / standby / Off)			
Connection DC / AC	integrated terminal block 16 mm² / standard AC plug + cable included			
Operating temperature	-15 °C to +45 °C			
Protection class	IP 20			
Weight	5.5 kg		7.5 kg	
Dimensions l x w x h	312 x 245 x 114 mm			

** only by RI versions (with integrated solar charge regulator)*

Technical data at 25 °C / 77 °F

Power class 550 - 900 W

0 W | 500 W | 1,000 W | 5,000 W | 10,000 W

SHS VPS COM RV SOC LCD

Steca AJ

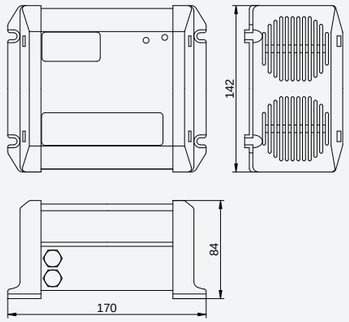
275-12, 350-24, 400-48, 500-12, 600-24, 700-48, 1000-12, 1300-24, 2100-12, 2400-24

A particular feature of the AJ inverter series is its wide range of available power classes and DC input voltages, enabling the optimal inverter to be used for any application. The cables for the battery and load connection are already pre-mounted on the AJ, thus making it easier to connect the device. The automatic standby mode considerably reduces the inverter's own consumption. The AJ inverter's excellent overload capacity ensures that even critical loads can be operated easily.

Features

- Power range 275 - 2,400 W
- Suitable for all AC loads
- Excellent overload capabilities
- Adjustable, automatic load detection
- Best reliability

Technical data



AJ 275-12

Power class
275 - 2,400 W

0 W | 500 W | 1,000 W | 5,000 W | 10,000 W

SHS | VPS | COM | RV

Electronic Protections

- Battery deep discharge protection
- Battery over voltage shut down
- Over temperature and over load protection
- Short circuit protection
- Reverse polarity protection by internal fuse (except than AJ2100-12)
- Acoustic warning before battery low or overheating disconnection

Displays

- Operational status inverter by LED

Options

- Types with 115 V / 50 Hz, 115 V / 60 Hz or 230 V / 60 Hz
- Terminal for connecting of a remote control (On / Off) for the types AJ275-12 to AJ700-48
- Remote Control JT8 (On / Off, LED) for AJ1000-12 to AJ2400-24

Inverter AJ	275-12	350-24	400-48	500-12	600-24	700-48	1000-12	1300-24	2100-12	2400-24
Nominal input voltage	12 V	24 V	48 V	12 V	24 V	48 V	12 V	24 V	12 V	24 V
Input voltage range	10.5 - 16 V	21 - 32 V	42 - 64 V	10.5 - 16 V	21 - 32 V	42 - 64 V	10.5 - 16 V	21 - 32 V	10.5 - 16 V	21 - 32 V
Output voltage	230 V~ +0 / -10 % (true sine wave)									
Output frequency	50 Hz +/-0.05 %									
Continuous power	200 VA	300 VA	300 VA	400 VA	500 VA	500 VA	800 VA	1000 VA	2000 VA	2000 VA
Max. power 30 min.	275 VA	350 VA	400 VA	500 VA	600 VA	700 VA	1,000 VA	1,300 VA	2,100 VA	2,400 VA
Max. power 5 sec.	450 VA	650 VA	1,000 VA	1,000 VA	1,200 VA	1,400 VA	2,200 VA	2,800 VA	5,000 VA	5,200 VA
Max. efficency	93 %	94 %	94 %	93 %	94 %	94 %	93 %	94 %	92 %	94 %
Consumption standby	0.3 W	0.3 W	0.4 W	0.3 W	0.4 W	1.0 W	0.3 W	0.4 W	0.5 W	0.4 W
Load detection (standby)	2 W			adjustable: 1 - 20 W						
Cable length Battery / AC	1.2 m / 1 m			1.5 m / 1 m					1.7 m / 1 m	
Operating temperature	-20 °C bis +50 °C									
Protection class	IP 30								IP 20	
Weight	2.4 kg	2.6 kg		4.5 kg			8.5 kg		19 kg	18 kg
Dimensions l x w x h	170 x 142 x 84 mm			247 x 142 x 84 mm			455 x 142 x 84 mm		406 x 273 x 117 mm	

Technical data at 25 °C / 77 °F

Steca XPC

1400-12, 2200-24, 2200-48

The Steca XPC series of inverters feature a very high overload capacity that even enables them to operate highly critical loads. Other important features of these high-quality inverters are their powerful device protection and their individual low own consumption. The XPCs combine a sine wave inverter, 4-stage battery charger and transfer system in one device, therefore making them particularly suitable for hybrid systems. The built-in multifunctional contact enables you, for example, to switch on and off diversion loads for excess power or start a diesel generator to recharge batteries.

Features

- Power range 1,400 - 2,200 W
- Adjustable battery charger included
- Excellent overload capabilities
- Adjustable, automatic load detection
- Usable as back-up or UPS
- Best reliability
- Multifunction switch

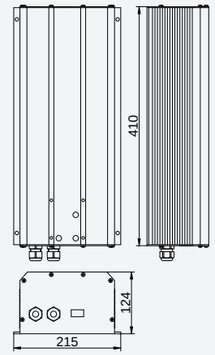
Electronic Protections

- Battery deep discharge protection
- Battery over voltage shut down
- Over temperature and overload protection
- Short circuit protection
- Reverse polarity protection by internal fuse
- Acoustic warning before battery low or overheating disconnection

Displays

- Operational status inverter by 7 LED

Technical data



XPC 2200-24

Inverter-Charger XPC	1400-12	2200-24	2200-48
Nominal input voltage	12 V	24 V	48 V
Input voltage range	9.5 - 16 V	19 - 32 V	38 - 64 V
Output voltage	230 V~ +0 / -10 % (pure sine wave)		
Output frequency	50 Hz +/-0.05 %		
Continuous power	1 100 VA	1 600 VA	1 600 VA
Max. power 30 min.	1 400 VA	2 200 VA	2 200 VA
Max. power 5 sec.	3 300 VA	4 800 VA	4 800 VA
Max. efficency	94 %	95 %	95 %
Consumption standby	0.6 W	0.9 W	1.3 W
Load detection (standby)	adjustable: 1 - 25 W		
Charging current, adjustable	0 - 45 A	0 - 37 A	0 - 20 A
Min. input voltage	adjustable from 150 to 230 VAC		
Battery monitoring	LVD, HVD, floating and equalisation voltage adjustable by user via optional remote control RCC-01		
Max. current / power on transfer system	16 A / 3.7 kVA		
Switching time	< 20 ms		
Cable length battery	165 cm		
Operating temperature	-20 °C to +55 °C		
Protection class	IP 20 / with optional top cover: IP 23		
Weight	11.7 kg	12.6 kg	
Dimensions l x w x h	410 x 215 x 124 mm		

Technical data at 25 °C / 77 °F

Power class
1,400 - 2,200 W

0 W | 500 W | 1,000 W | 5,000 W | 10,000 W

SHS | VPS | COM | RV | HYBRID | 6720 W | UPS

Options

- Types with 230 V / 60 Hz
- Remote control RCC-01 (With this additional device it is also possible to programme the inverter parameters.)
- Protection cover C-IP 23 to enhance the protection class
- Terminal protection cover CFC-01 to avoid hazardous contacts with strain relief clamps
- Temperature sensor CT35 to correct the operation voltages according to the actual battery temperature

Steca Compact
1600-12, 2600-24, 4000-48

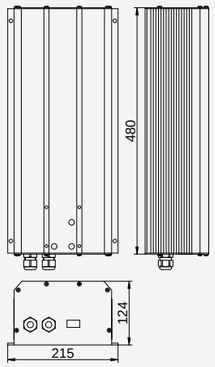
The Steca Compact series is specially designed for hybrid systems. The devices consist of a sine wave inverter with a high overload capacity, a battery charger and a transfer system. The built-in multifunctional contact enables you, for example, to start a diesel generator to recharge batteries or to cut the power for less priority loads when the battery is lower than a given threshold. Even if you only use the device's sine wave inverter, Steca Compact is still very cost effective. The integrated power sharing function ensures that the transfer system always provides the connected loads with the desired power.

Features
- Power range 1,600 - 4,000 W
- Adjustable battery charger included
- Excellent overload capabilities
- Adjustable, automatic load detection
- Usable as back-up or UPS
- Adjustable power sharing
- Best reliability
- Multifunction switch

Electronic Protections
- Battery deep discharge protection
- Battery over voltage shut down
- Over temperature and overload protection
- Short circuit protection
- Reverse polarity protection by internal fuse
- Acoustic warning before battery low or overheating disconnection

Displays
- Operational status inverter and state of charge by 17 LEDs
- Power monitor for topical power and charging current

Technical data



Steca Compact
1600-12, 2600-24

Inverter-Charger Compact	1600-12	2600-24	4000-48
Nominal input voltage	12 V	24 V	48 V
Input voltage range	9.5 - 16 V	19 - 32 V	38 - 64 V
Output voltage	230 V~ +0 / -10 % (pure sine wave)		
Output frequency	50 Hz +/-0.05 %		
Continuous power	1,300 VA	2,300 VA	3,500 VA
Max. power 30 min.	1,600 VA	2,600 VA	4,000 VA
Max. power 5 sec.	3,900 VA	6,900 VA	10,500 VA
Max. efficency	94 %	95 %	95 %
Consumption standby	0.6 W	0.9 W	1.4 W
Load detection (standby)	adjustable: 1 - 25 W		
Charging current, adjustable	0 - 55 A	0 - 55 A	0 - 50 A
Input current balance adj., power sharing	1 - 16 A		
Min. input voltage	adjustable from 150 to 230 VAC		
Battery monitoring	LVD, HVD, floating and equalisation voltage adjustable by user		
Max. current / power on transfer system	16 A / 3.7 kVA		
Switching time	< 20 ms		
Cable length battery	165 cm		
Operating temperature	-20 °C to +55 °C		
Protection class	IP 20 / with optional top cover: IP 23		
Weight (kg)	16.0 kg	17.1 kg	29.4 kg
Dimensions (l) x 215 x 124 mm	480 mm	480 mm	670 mm

Technical data at 25 °C / 77 °F

Power class
1,600 - 4,000 W

0 W | 500 W | 1,000 W | 5,000 W | 10,000 W

SHS | VPS | COM | RV | HYBRID | DC AC UPS

Options
- Types with 230 V / 60 Hz
- Remote control RCC-01
- Protection cover C-IP 23 to enhance the protection class
- Terminal protection cover CFC-01 to avoid hazardous contacts with strain relief clamps
- Temperature sensor CT35 to correct the operation voltages according to the current battery temperature
- Remote control RPS-01 for the function power sharing

Steca HPC
2800-12, 4400-24, 6000-48, 8000-48

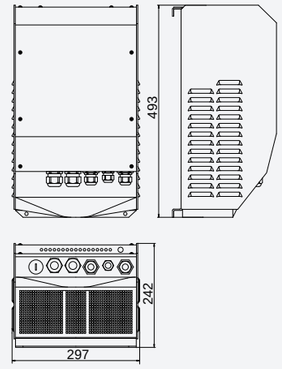
The technology of the HPC inverter series is based on Steca Compact devices. However, the four different types offer considerably greater power. What's more, Steca HPCs are equipped with PG screw fittings for strain relief and to protect all connections. The devices consist of a sine wave inverter, a battery charger, a transfer system and a voltage-free multifunctional contact. They are primarily used in hybrid systems. The integrated power sharing function ensures that the transfer system always provides the connected loads with the desired power.

Features
- Power range 2,800 - 8,000 W
- Adjustable battery charger included
- Excellent overload capabilities
- Adjustable, automatic load detection
- Usable as back-up or UPS
- Adjustable power sharing
- Best reliability

Electronic Protections
- Battery deep discharge protection
- Battery over voltage shut down
- Over temperature and overload protection
- Short circuit protection
- Reverse polarity protection by internal fuse
- Acoustic warning before battery low or overheating disconnection

Displays
- Operational status inverter and state of charge by 17 LEDs
- Power monitor for topical power and charging current

Technical data



HPC 8000-48

Inverter-Charger HPC	2800-12	4400-24	6000-48	8000-48
Nominal input voltage	12 V	24 V	48 V	48 V
Input voltage range	9.5 - 17 V	19 - 34 V	38 - 68 V	38 - 68 V
Output voltage	230 V~ +0 / -10 % (pure sine wave)			
Output frequency	50 Hz +/-0.05 %			
Continuous power	2,500 VA	4,000 VA	5,000 VA	7,000 VA
Max. power 30 min.	2,800 VA	4,400 VA	6,000 VA	8,000 VA
Max. power 5 sec.	7,500 VA	12,000 VA	15,000 VA	21,000 VA
Max. efficency	93 %	94 %	96 %	96 %
Consumption stand-by	1.8 W	2.0 W	2.5 W	3.0 W
Load detection (stand-by)	adjustable: 1 - 25 W			
Charging current, adjustable	0 - 110 A	0 - 100 A	0 - 70 A	0 - 90 A
Input current balance adj., power sharing	1 - 30 A			1 - 50 A
Min. input voltage	adjustable from 150 to 230 VAC			
Battery monitoring	LVD, HVD, floating and equalisation voltage adjustable by user			
Max. current / power on transfer system	30 A / 6.9 kVA			50 A / 11.5 kVA
Switching time	< 20 ms			
Operating temperature	-20 °C to +55 °C			
Protection class	IP 20			
Weight	33	39	41	45
Dimensions (l) x 297 x 242 mm	480 mm			493 mm

Power class
2,800 - 8,000 W

0 W | 500 W | 1,000 W | 5,000 W | 10,000 W

SHS | VPS | COM | RV | HYBRID | DC AC UPS

Options
- Types with 230 V / 60 Hz
- Remote Control RCC-01
- Temperature sensor CT35 to correct the operation voltages according to the current battery temperature
- Remote control RPS-01 for the function power sharing

Xtender XTH

3000-12, 5000-24, 6000-48, 8000-48

The serie Xtender offers a new function, the Smart-Boost, which enables to add the inverter power to another source, like for instance a genset or the shorepower, even in case of asymetric loads. It is also possible to add an Xtender to almost any other existing inverter in order to increase the power available.

The products of the Xtender-Series provide an unmatched freedom of use, thanks to their many functions. In a basic application, they offer together the functions of inverter, battery charger, transfersystem and assistance to the source.

These functions can be combined and controlled in a totally automatic way for an exceptional comfort and an optimal management of the available energy.

By the implementation of several units, it is possible to create a 3-phase source or to set them in parallel to increase the power available. Up to 9 inverters of the serie Xtender shall therefore be combined together (see page 49).

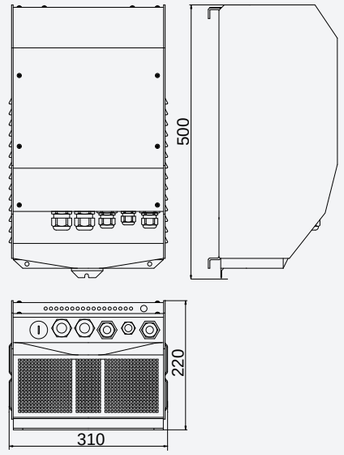
The programmable auxiliary contacts allow as well the interconnection with existing systems or the implementation of extended functions. Fully programmable by means of its remote control, it enables the update of the software, making it an upgradeable product.

Multifunctional contacts

The potential free contacts can be programmed to provide many supplementary functions.

They can react to each event, inside or outside of the inverter (presence of the grid, battery thresholds, alarm signal). The contacts can also be programmed as time switch or can be disabled during sensitive periods (night, weekend). They allow therefore the implementation of functions like the automatic start of gensets, the automatic disconnection of second priority users, the alarm signal, the conditional charge of the battery, etc.

Technical data



Power class 3,000 W - 72,000 W

0 W | 5,000 W | 25,000 W | 50,000 W | 75,000 W | 100,000 W

SHS | VPS | COM | RV | HYBRID | UPS

Function Smart-Boost

The function Smart-Boost enables to add the inverter power to another source, like for instance a genset or the shorepower, even in case of asymetric loads. It is possible to add an Xtender to almost any other existing inverter in order to increase the power available.

Features

- Possibility to connect up to 3 Xtenders in parallel
- Three-phase systems with up to 9 Xtenders
- True sine wave voltage
- Reliable and noiseless with any kind of load
- Outstanding overload capabilities
- Function Smart-Boost for assistance to the source even with difficult loads
- Automatic reduction of peak loads (power shaving)
- Automatic allocation of the power available (power sharing)
- Standby level adjustable over a large range and from a very low threshold
- Multi-stage programmable 4 STEP battery charger with PFC
- Ultra-fast transfer relay
- High efficiency
- Ultra-fast regulation
- Control by digital signal processors (DSP)
- Full internal protection.

Model	XTH 3000-12	XTH 5000-24	XTH 6000-48	XTH 8000-48
Inverter				
Nominal battery voltage	12 V	24 V	48 V	48 V
Input voltage range	9.5 - 17 V	19 - 34 V	38 - 68 V	38 - 68 V
Continuous power @ 25 °C	2500 VA	4000 VA	5000 VA	7000 VA
Power Smart-Boost	2500 VA	4000 VA	5000 VA	7000 VA
Power 30 min. @ 25 °C	3000 VA	5000 VA	6000 VA	8000 VA
Power 5 sec. @ 25 °C	3 x Pnom			
Load detection (standby)	2 to 25 W			
Cos φ	0.1 - 1			
Max. efficiency	93 %	94 %	96 %	96 %
Consumption OFF/standby/ON	1.7 W / 2.2 W / 14 W	1.8 W / 2.5 W / 20 W	2.2 W / 3 W / 22 W	2.2 W / 3.8 W / 34 W
Output voltage	230 Vac (- 10 % / 0)			
Output frequency	50 / 45-65 Hz +/- 0.05 % (crystal controlled)			
Harmonic distortion	< 2 %			
Overload and short-circuit protection	Automatic disconnection with 3 time restart attempt			
Overheat protection	Warning before shut-off - with automatic restart			
Battery charger 6 step adjustable : I-U-Uo-Equalize-Uo(low)-U(periodic)				
Charging current adjustable	0 - 160 A	0 - 140 A	0 - 100 A	0 - 120 A
Input current balance adjustment	1 - 30 A			1 - 50 A
Max. input voltage	265 Vac			
Input AC voltage range	Adjustable threshold from 150 to 230 Vac			
Input frequency	45 - 65 Hz			
Power Factor Correction (PFC)	Yes, according to EN 61000-3-2			
General data				
Multifunction contact adjustable	2 independent contacts 16 A 250 Vac (potential free 3 points)			
Max. current on transfer relay	30 A / 6.9 kVA			50 A / 11.5 kVA
Weight	34 kg	40 kg	42 kg	46 kg
Dimension h x w x l	220 x 290 x 500 mm			220 x 310 x 500 mm
Protection index	IP 23			
Operating temperature range	-20 °C to 55 °C			
Ventilation	Forced from 45 °C			
Acoustic level	< 10 dB / < 35 dB (with / without ventilation)			

Xtender Accessories

Remote control and programming centre RCC-03

Thanks to its graphic display it provides many understandable indications on the state of the system.

The remote control memorises and displays the events that occurred on an installation and so it does anticipate the problems that might appear.

It gives access to the many adjustable parameters of the Xtender like the setting of the charge curve of the battery, the programming of the auxiliary relays or even, among others, to a lot of operation options.

A place is dedicated to a SD card which will allow the parameters memorising, the data transfer or the software update.

Battery temperature sensor BTS-01

This sensor enables to accurately adapt the charge thresholds to the battery temperature.

Communication module 3ph and parallel PEM-01

Allows the setting in parallel or the implementation of a 3-phase system even when only a single-phase source is available.

Communication cable for 3ph and parallel CAB-RJ45-2 (2 m)

Allows the setting in parallel or the implementation of a 3-phase system even when only a single-phase source is available.

Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com

Hot water from the sun

Washing, heating, taking baths and showers - all with the thermal energy of the sun, an energy source which will remain useable for millions of years. Solar thermal energy is - thanks to companies like Steca who promote innovation - the current standard in many households. A mature, high-performance technology guarantees that a large proportion of the hot water requirement is provided for by using solar energy.

Steca's solar thermal energy products ensure the safe, effective operation of solar power systems for domestic water heating and backup heating. They constitute the most important connections to the heart of the system, the collector. Solar controllers, temperature sensors and circulation pumps control and regulate the system, ensuring that it operates without technical problems, and furthermore, they monitor and check its technical procedures. Moreover, the wide range of solar thermal products stands out in terms of high efficiency and ease of operation. This makes the sun - thanks to Steca - into an everyday energy resource which can be taken as a matter of course.

S O L A R T H E R M A L

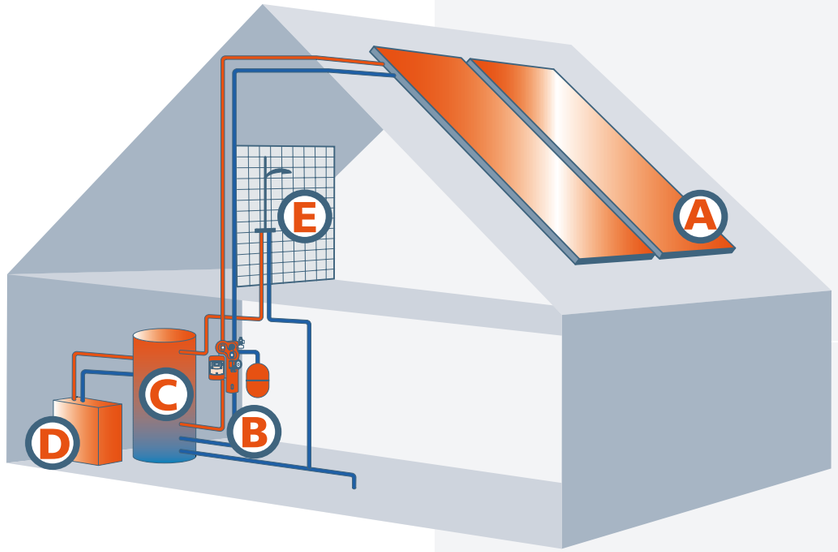
Steca Temperature Differential Controller

and Accessories

Steca Solar Stations

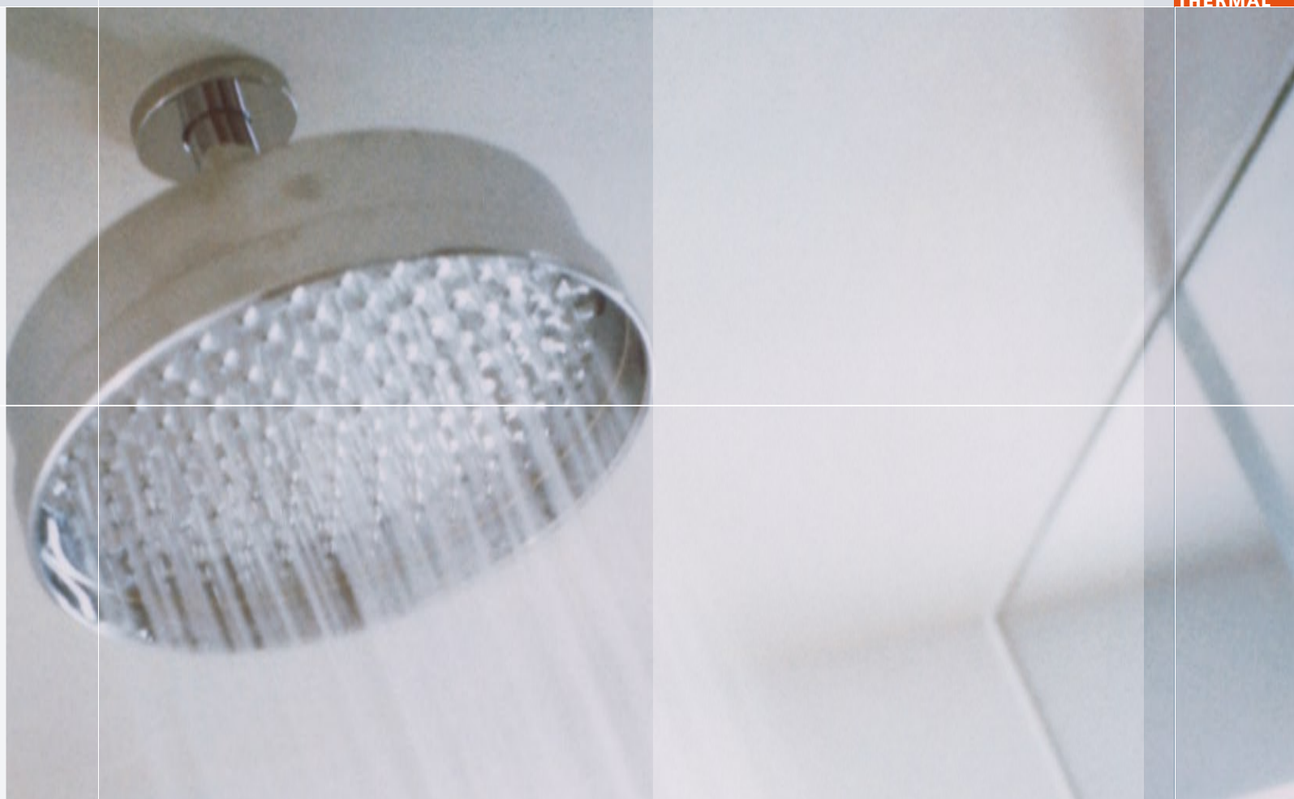
and Accessories

Steca Temperature Sensor



Legend:

A Collector
B Solar Station
C Storage tank
D Central-heating boiler
E Usage of water



Solar thermal systems

Solar thermal systems convert incident solar irradiation into heat so that it can be used to heat domestic hot water or for additional heating.

The solar irradiation is converted into heat in the collector whose main component is a selectively-coated absorber. The heat is pumped via a closed piping system, the solar circuit, from the collector to the storage tank. The solar system not only provides hot water in the summer and in transitional periods, but can also even provide some in winter. A frost-resistant mixture of water and glycol is used to prevent the heat-transfer fluid freezing in the solar circuit.

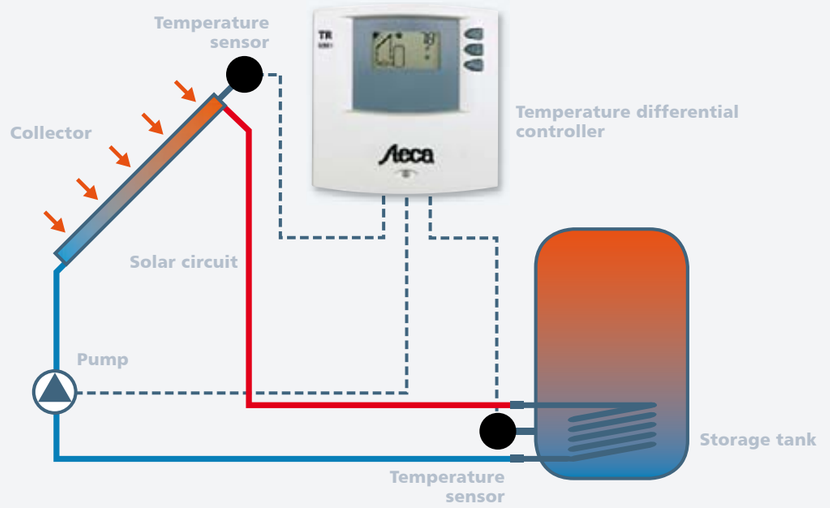
Temperature differential control

A temperature differential controller regulates the transport of heat from the collector to the storage tank. The controller always starts the circulation pump of the solar circuit when the temperature in the collector is several degrees warmer than the temperature at the bottom of the storage tank. This transports the solar fluid from the collector to the lower heat exchanger, where the heat is transferred to the drinking water in the storage tank via the solar circuit heat exchanger. The cooled solar fluid then flows back to the collector in the return pipes.

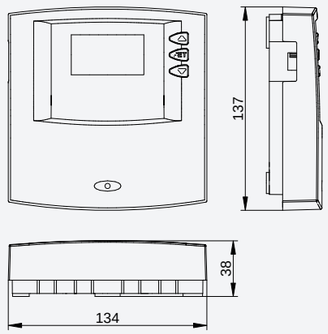
The heated drinking water rises in the storage tank. The water is stratified in the storage tank according to its density or temperature: The hottest water is at the top (where it is drawn off), the coldest water is at the bottom (where cold water is fed in).

With the current standard system size for one to two family houses (approx. 1.0 to 1.5 m² collector surface per person and approx. 80-100 l storage tank volume), the drinking water in summer is primarily heated by the solar system. This results in an annual solar coverage (percentage of the total energy requirement for heating drinking water provided by solar energy) of approx. 60 percent. The remaining 40 percent must be covered by additional heating. This is generally performed by a solid fuel and the upper reheating heat exchanger of the storage tank.

You can select a tailor-made controller from the Steca solar thermal controller product family based entirely on the requirements of your solar system. A range of monitoring and control functions guarantee that your solar system runs safely and maximise its service life.



Technical data



Temperature Differential Controller	TR 0201
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 1 W
Inputs	2 2 x temperature determination (Pt1000)
Output	1 1 x switch output relay, max. 800 W [230 V]
Turn-on temperature difference	4 - 20 K
Turn-off temperature difference	2 - 18 K
Operation temperature range	0 °C ...+45 °C
Display	LCD-Display with 48 Segments
Protection class	IP 20 / DIN 40050
Weight	250 g
Dimensions l x w x h	137 x 134 x 38 mm

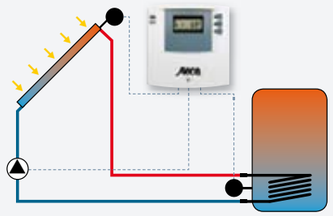
Steca TR 0201

The solar thermal controller TR 0201 provides everything your solar thermal system requires for safe and long-lasting operation. The microprocessor-controlled regulator monitors and controls thermal solar energy systems by means of a collector unit and a storage tank. Apart from controlling the solar system, the controller also adopts important system monitoring and safety functions. The system parameters and measured values can be viewed and altered via the LCD-Display. The controller is equipped with two inputs for recording the temperature and one output for triggering the solar circuit pump. The components delivered with the controller include a collector temperature sensor (type Pt1000) and a storage tank temperature sensor (type Pt1000). The numerous additional functions of the TR 0201 include the option of limiting the storage tank temperature, a tube collector function, an anti-freeze function, as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (°F). The operational safety of the system is supported by a sophisticated fault diagnosis. The LCD display ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

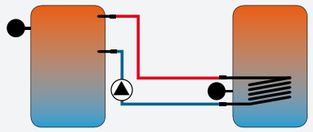
Features

- Compact, 3 piece designer case
- Anti-freeze function
- Tube collector function
- Limitation of storage tank temperature
- Definable switch-on temperature difference
- Definable switch-off temperature difference
- Temperature display for storage tank and collector
- Pump operating status display
- Temperature sensor monitoring and system monitoring
- Temperature display °C / °F

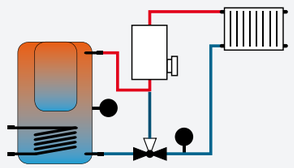
System examples



System with 1 storage tank

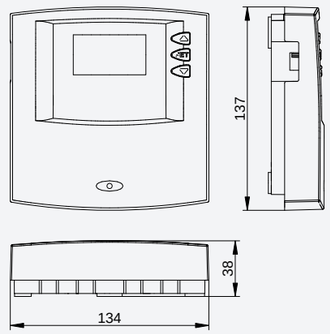


Recharging storage tanks



Return increase

Technical data



Temperature Differential Controller	TR 0301
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 1 W
Inputs	3 3 x temperature determination (Pt1000)
Output	1 1 x switch output relay, max. 800 W [230 V]
Turn-on temperature difference	8 K
Turn-off temperature difference	4 K
Operation temperature range	0 °C...+45 °C
Animated LCD-Display	2 colour backlight
Protection class	IP 20 / DIN 40050
Weight	250 g
Dimensions l x w x h	137 x 134 x 38 mm

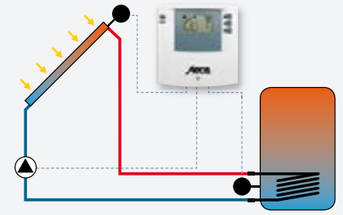
Steca TR 0301

The controller TR 0301 was the first controller on the market to be equipped with a graphic display, on which an animated solar circuit of a solar energy system fully indicates the operating mode of the system. The consistent use of pictograms on the clearly arranged display ensures easy operation. The controller was jointly designed with an internationally renowned design centre. The controller is used for monitoring and controlling of solar thermal energy systems having a collector array and a storage tank. In addition, the controller also has important system monitoring and safety functions to ensure safe and durable operation of the entire system. The numerous additional functions of the bus-capable TR 0301 also include the option of limiting the storage tank temperature, a tube collector function, an anti-freeze function, a holiday and storage recool function as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (F°). The operational safety of the system is also supported by a sophisticated fault diagnosis system. The multi-coloured LCD-backlighting ensures the swift and safe detection of errors and allows faults to be quickly rectified.

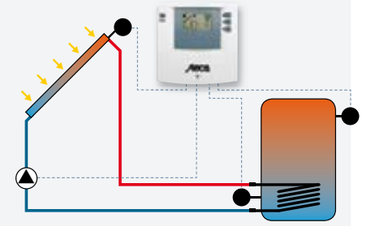
Features

- Backlight LCD-Display
- Animated representation of solar system functions
- Compact, 3 piece designer case
- Tube collector function
- Holiday (storage recool) function
- Limitation of storage tank temperature
- Temperature display °C / °F

System examples

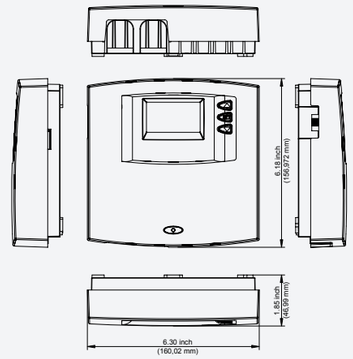


System with 1 storage tank



System with 1 storage tank and 3 temperature sensors

Technical data



Steca TR 0301 U

The TR 0301 U controller was specially developed for the North American market based on the TR 0301 basic controller. With its highly fireproof case and special certification (ETL label) from a Nationally Recognized Testing Laboratory (NRTL) in the US, the controller meets the safety standards and minimum requirements needed in order to be sold and distributed in North America.

A feature of the TR 0301 series of controllers is the animated graphic display, which offers a complete visualisation of the solar system's operating mode and solar circuit.

The clearly arranged display ensures easy operation using pictograms. The controller was jointly designed with an internationally renowned design centre. The controller is used for monitoring and controlling solar thermal systems which have a collector array and a storage tank. In addition, the controller also has important system monitoring and safety functions to ensure safe and durable operation of the entire system. The numerous additional functions of the TR 0301 also include the option of limiting the storage tank temperature, a tube collector function, an antifreeze function, a holiday and storage re-cool function as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (F°). The operational safety of the system is supported by a sophisticated fault diagnosis. The multi-coloured LCD backlight ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

The TR 0301 U controller is supplied with a pre-fitted US mains connection cable and a preinstalled, pluggable pump output.

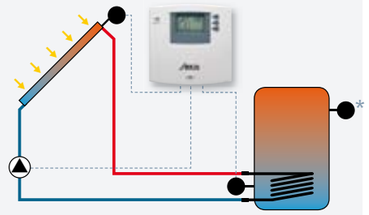
Temperature Differential Controller	TR 0301 U
System voltage	120 VAC, 60 Hz [optional 240 VAC, 60 Hz]
Max. own consumption	≤ 1 W (≤ 0.001 HP)
Inputs	3 3 x temperature recording (Pt1000)
Output	1 Switch relay; switching performance max. 400 W (0.5 HP [120 V~]) or 800 W (1 HP [240 V~])
Turn-on temperature difference	8 K (46.4 °F)
Turn-off temperature difference	4 K (39,2 °F)
Operation temperature range	0 °C ... +45 °C (32 ... +113 °F)
Animated LCD-Display	2 colour backlight
Protection class	IP 20/DIN 40050
Weight	0.55 kg (19.54 oz) including cable
Dimensions l x w x h	160 x 157 x 47 mm 6.3" x 6.18" x 1.85"
Temperature sensors 2 x Pt1000	Collector sensor: 59 inch (1.5 m) silicone cable with bushing (Measuring range up to +356 °F (+ 180 °C)) Storage tank sensor: 11.8 inch (0.3 m) twisted single conductor flat surface sensors with compression cable lug (Measuring range up to 222 °F (+105 °C))

Collector 1 st. tank

Features

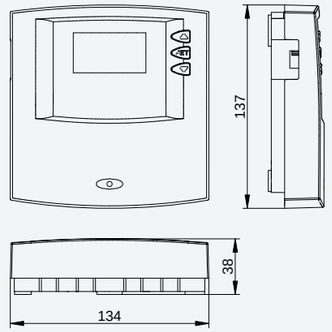
- Backlight LCD-Display
- Animated representation of solar system functions
- Compact, 3-piece designer case
- Anti-freeze function
- Tube collector function
- Holiday (storage re-cool) function
- Limitation of storage tank temperature
- Temperature display for storage tank and collector
- Pump operating status display
- Temperature sensor monitoring and system monitoring
- Temperature display °C / °F

System examples



System with 1 storage tank
*optional

Technical data



Steca TR 0301sc

The controller TR 0301sc is the RPM-controllable version of the basic controller TR 0301. In addition to the speed control of the solar circuit pump, the TR 0301sc also allows logging of the solar circuit pump's hours of operation, as well as recording the minimum and maximum temperature values from the collector and the storage tank. The controller is used for monitoring and controlling solar thermal systems which have a collector array and a storage tank. With its animated graphic display, which is clearly arranged, the TR 0301sc visualizes the operational status as well as the complete solar circuit of the solar energy system. The consistent use of pictograms helps make the controller easy to operate. The controller also performs important system monitoring and safety functions to ensure safe and long-lasting operation of the entire system. The numerous additional functions of the TR 0301sc include the option of limiting the storage tank temperature, a tube collector function, an antifreeze function, a holiday and storage re-cool function, as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (°F). The operational safety of the system is supported by a sophisticated fault diagnosis. The multi-colored LCD backlight ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

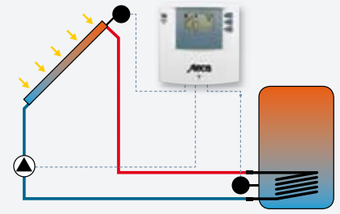
Temperature Differential Controller	TR 0301sc
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 1 W
Inputs	3 3 x temperature determination (Pt1000)
Output	1 1 x R1 triac for speed control, max. 200 W [230 V]
Turn-on temperature difference	8 K
Turn-off temperature difference	4 K
Operation temperature range	0 °C...+45 °C
Animated LCD-Display	2 colour backlight
Protection class	IP 20 / DIN 40050
Weight	250 g
Dimensions l x w x h	137 x 134 x 38 mm

Collector 1 st. tank

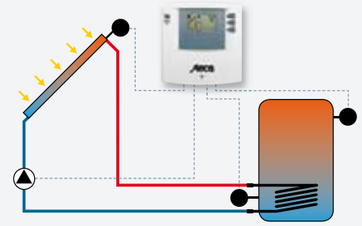
Features

- Backlight LCD-Display
- Functioning of solar energy system shown in animated display
- Compact, 3 piece designer case
- Speed control of solar circuit pump
- Tube collector function
- Holiday (storage recool) function
- Limitation of storage tank temperature
- Temperature display °C / °F
- Logging of solar circuit pump operating hours
- Minimum and maximum displays of the storage tank and collector temperatures

System examples



System with 1 storage tank



System with 1 storage tank and 3 temperature sensors

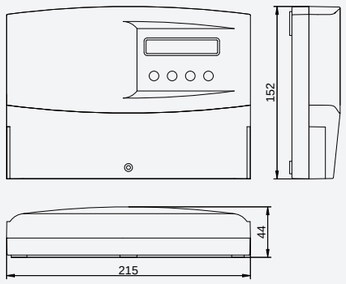
Steca Sundra

The solar thermal controller is used for monitoring and controlling of solar thermal energy systems having a collector array and a storage tank. Apart from controlling the solar system, the controller also has important system monitoring and safety functions. This controller satisfies all the requirements of a solar thermal system. The system parameters and measured values can be viewed and modified via a 16-digit LCD-Display. The controller has two inputs for temperature measurement and an output for controlling a speed controlled solar pump. Installation mistakes are avoided by the automatic recognition of temperature sensors by the controller. The components delivered with the controller include a collector temperature sensor and a storage tank temperature sensor in the lower part of the storage tank to allow limiting of the maximum storage tank temperature. Alternatively, the controller can be used for loading a domestic hot water or buffer tank through a solid fuel or multifuel burning stove.

Features

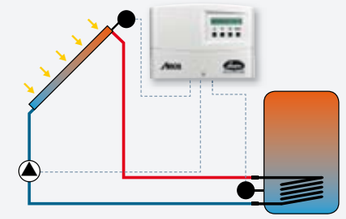
- Easy operation by menu-driven LCD-Display
- Software-controlled collector cooling function
- Speed control of solar circuit pump
- Limitation of storage tank temperature
- Temperature sensor monitoring and fault analysis
- Logging of solar circuit pump operating hours
- Minimum and maximum displays of the storage tank and collector temperatures
- Automatic recognition of the Pt1000 or KTY temperature sensors

Technical data

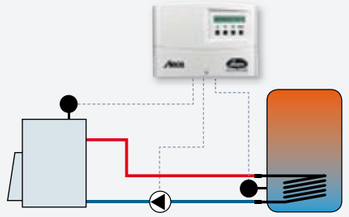


Temperature Differential Controller	Sundra
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 1 W
Inputs	2 2 x temperature determination (Pt1000 or KTY81-210)
Output	1 1 x R1 triac for speed control, max. 200 W [230 V]
Turn-on temperature difference	4 ...17 K
Turn-off temperature difference	2 ...15 K
Operation temperature range	0 °C ...+45 °C
Display	LCD-Display
Protection class	IP 20 / DIN 40050
Weight	460 g
Dimensions l x w x h	150 x 215 x 44 mm

System examples



System with 1 storage tank



System with solid fuel

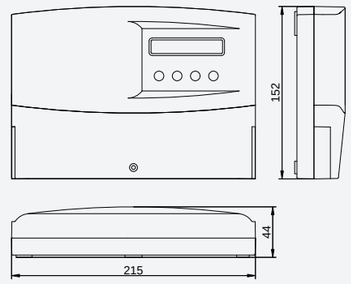
Steca Suntana

The Suntana solar thermal controller is another member of our solar controller family. The controller monitors and controls solar thermal energy systems with a collector array, a storage tank and alternatively with an appropriate back-up heating or circulation pump. Apart from controlling the solar system, the controller also performs important system monitoring and safety functions. The system parameters and measured values can be viewed and modified via a 2 x 16-digit menu-driven LCD-Display. The amount of solar energy fed from the collector array into the storage tank can be read from the LCD-Display at any time, thanks to a flow meter with pulse output. The controller has a maximum of five inputs for temperature measurement, a digital pulse input for recording heat volume data, and two outputs for controlling pumps. A programmable timer with selectable switching times for controlling a solar circuit pump is integrated into the unit. Installation mistakes are avoided from the very beginning through the automatic recognition of the temperature sensors. The components delivered with the controller include a collector temperature sensor and two storage tank sensors.

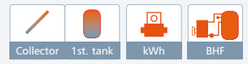
Features

- Easy operation by menu-driven LCD-Display
- Time and temperature dependent control of circulation control
- Adjustable cooling and back-up heating function
- Software-controlled collector cooling function
- Speed control of solar circuit pump
- Limitation of storage tank temperature
- Temperature sensor monitoring and fault analysis
- Logging of solar circuit pump operating hours
- Minimum and maximum displays of the storage tank and collector temperatures
- Automatic recognition of the Pt1000 or KTY temperature sensors
- Measurement and logging of heat volumes

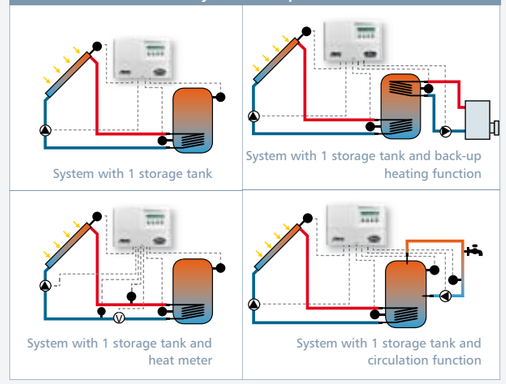
Technical data



Temperature Differential Controller	Suntana
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max.own consumption	≤ 1 W
Inputs	6 5 x temperature determination (Pt1000 or KTY81-210) 1 x pulse detection for calorimetry
Outputs	2 1 x R1 triac for speed control, max. 200 W [230 V] 1 x R2 switch output, max. 800 W [230 V] or R2 voltage free
Turn-on temperature difference	4...17 K
Turn-off temperature difference	2...15 K
Operation temperature range	0 °C...+45 °C
Display	LCD-Display
Protection class	IP 20 / DIN 40050
Weight	490 g
Dimensions l x w x h	150 x 215 x 44 mm



System examples


System with 1 storage tank
System with 1 storage tank and back-up heating function
System with 1 storage tank and heat meter
System with 1 storage tank and circulation function

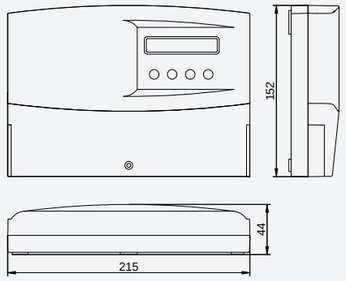
Steca Suntana 2

The microprocessor-controlled Suntana 2 controller is used for monitoring and controlling of solar thermal energy systems having two differently aligned collector arrays and a maximum of two domestic hot water and buffer storage tanks. The system parameters and measured values can be viewed and modified via a 2 x 16-digit menu-driven LCD-Display. The amount of solar energy fed from the collector array into the storage tank can be read from the LCD-Display at any time, thanks to a flow meter with pulse output. The integrated hours of operation logger is used to automatically monitor both controller outputs and provides extra operational safety for your solar energy system. The controller has a maximum of five inputs for temperature measurement, a digital pulse input for recording heat volume data, and two outputs for controlling pumps or a switching valve.

Features

- Pump-pump or pump-valve control of:
  - 2-storage tank systems with storage tank priority switching
  - 2-collector systems with east/west orientation
  - 2 completely separate solar systems
- Heat volume meter and hours-of-operation logger
- Storage of minimum and maximum temperature values
- Speed control of the solar circuit pump
- Menu-driven LCD-Display

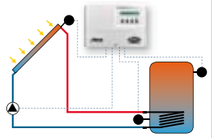
Technical data



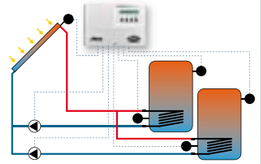
Temperature Differential Controller	Suntana 2
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 1 W
Inputs	6 5 x temperature determination (Pt1000 or KTY81-210) 1 x pulse detection for calorimetry
Outputs	2 1 x R1 triac for speed control, max. 200 W [230 V] 1 x R2 switch output relay, max. 800 W [230 V] or R2 voltage free
Turn-on temperature difference	4 ...17 K
Turn-off temperature difference	2 ...15 K
Operation temperature range	0 °C ...+45 °C
Display	LCD-Display
Protection class	IP 20 / DIN 40050
Weight	490 g
Dimensions l x w x h	150 x 215 x 44 mm

System examples

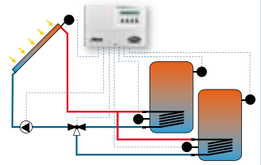
Steca Suntana 2



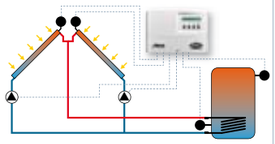
System with 1 storage tank



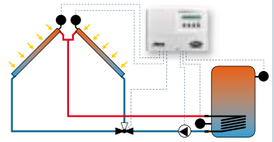
System with 2 storage tanks and pump control



System with 2 storage tanks and valve control

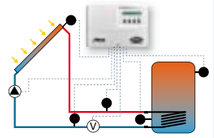


System with east/west roof, 1 storage tank and pump control

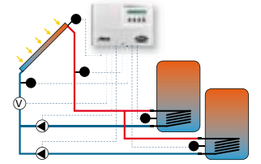


System with east/west roof, 1 storage tank, valve control and heat meter

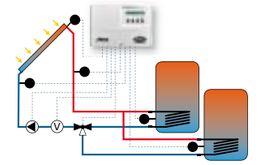
with heat meter



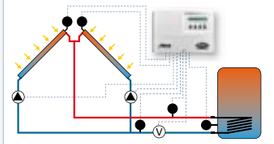
System with 1 storage tank and heat meter



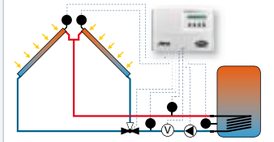
System with 2 storage tanks, pump control and heat meter



System with 2 storage tanks, valve control and heat meter

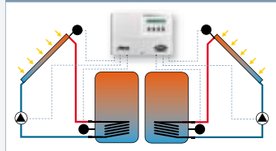


System with east/west roof, 1 storage tank, pump control and heat meter



System with east/west roof, 1 storage tank, valve control and heat meter

2 Solar energy systems



2 separate solar energy systems

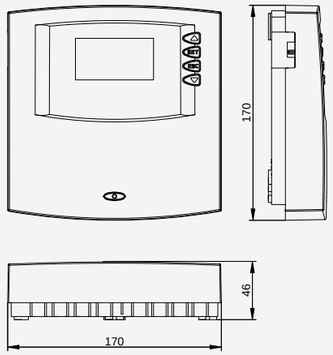
Steca TR 0502

The new TR 0502 solar thermal controller closes the gap between the already successful TR 0301, TR 0301sc and TR 0603 temperature differential controllers. With its animated graphic display and elegant design, it continues the success enjoyed by this family of controllers. This controller provides everything your solar thermal system requires for safe and durable operation. The controller TR 0502 is used for monitoring and controlling of solar thermal energy systems having two differently aligned collector arrays or a maximum of two domestic hot water and buffer storage tanks. The large display panel shows the animated control circuits, which allow you to view the operating conditions of each system. The clearly arranged display ensures easy operation using pictograms. Pre-programmed plant systems enable universal usage. The TR 0502 controller also has 5 inputs for recording temperatures or pulse values, as well as 2 speed-controlled outputs for controlling pumps or switching valves.

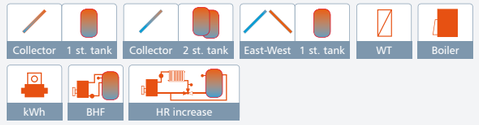
Features

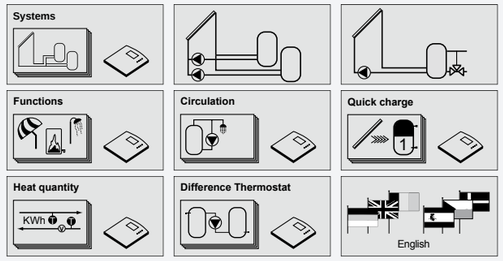
- Backlight LCD-Display showing animated representation of the systems and their operating status
- Selectable limitation of storage tank temperature
- Targeted storage tank loading
- Heating return increase
- Freely programmable thermostat
- Freely programmable differential thermostat
- Timer functions
- Calorimetry
- Back-up heating function
- Circulation function
- Solid fuel boiler back-up heating
- Tube collector function
- Holiday (storage recool) function
- Anti-freeze function
- High degree of operational safety through fault diagnosis
- Selectable storage tank loading strategies
- Interval function
- Rapid storage tank loading
- Reduction of system stagnation phases
- Daily pump starts
- Multilingual menu navigation

Technical data



Temperature Differential Controller	TR 0502
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 3 W
Inputs	5 4 x temperature recording (Pt1000), 1 x temperature recording or pulse
Additional input	1 x "Direct Sensor" (temperature/flow rate)
Outputs	2 1 x relay switched output, 1 x triac output for speed control
Additional output	1 x alarm output
Number of pre-defined hydraulic schemes	14
Interfaces	RS232
Permitted ambient temperature	0 °C ... +45 °C
Display	animated graphic LCD with 2 colour backlight
Protection degree	IP 20/DIN 40050
Weight	450 g
Measurements l x w x h	170 x 170 x 46 mm





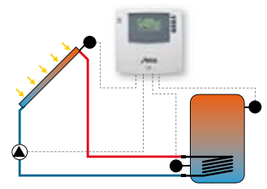
Display examples
The display examples shown here are merely a selection, designed to show the many and diverse function displays of the TR 0502 controller.

Graphic display

The new TR 0502 solar thermal controller is also equipped with the fully animated graphic display. With this display, Steca has managed to represent the different system layouts and numerous functions in a clearly laid out display that is easy to understand. This is supported by the ability to display information in a number of different languages. Apart from the usual high quality of all Steca products, the strength of this controller lies in the ease of use and the high level of functionality.

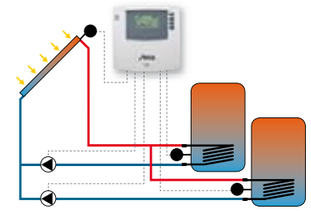
System examples

1-storage-tank systems

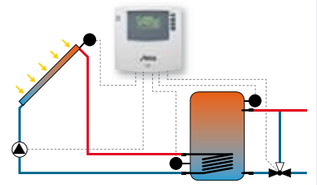


System with 1 storage tank

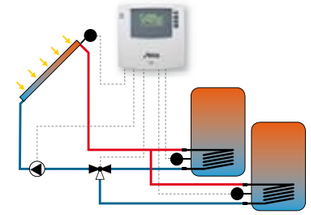
2-storage-tank systems



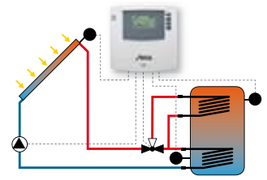
System with 2 storage tanks and pump control



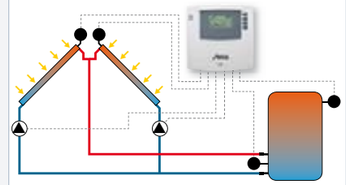
System with heating return increase and storage tank



System with 2 storage tanks and valve control

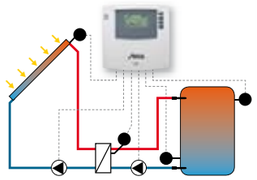


System with zone loading and 1 storage tank



System with east/west roof, 1 storage tank and valve control

with external heat exchanger



System with 1 storage tank and external heat exchanger

Casing design
The casing was jointly designed with the internationally renowned design centre "Busse-Design". The well thought-out case allows easy installation and is particularly service-friendly.

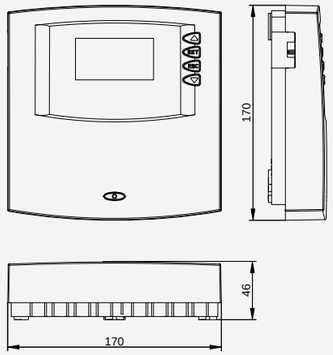
Steca TR 0603

The new solar thermal controller TR 0603 with his absolute advantages as animated graphic display and elegant design continues the success enjoyed by this family of controllers. This controller provides everything your solar thermal system requires for safe and durable operation. The controller TR 0603 is used for monitoring and controlling of solar thermal energy systems having two differently aligned collector arrays and a maximum of three domestic hot water or buffer storage tanks. The large display panel shows the animated control circuits, which allow you to view the operating conditions of each system. The consistent use of pictograms on the clearly arranged display ensures easy operation. 15 pre-programmed solar energy systems allow universal application. The TR 0603 controller also has 6 inputs for recording temperatures or pulse values, as well as 3 speed-controlled outputs for controlling pumps or switching valves.

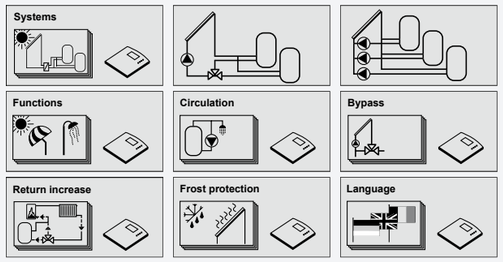
Features

- Backlight LCD-Display showing animated representation of the systems and their operating status
- Selectable limitation of storage tank temperature
- Targeted storage tank loading
- Heating return increase
- Bypass switching
- Freely programmable thermostat
- Timer functions
- Heat meter
- Back-up heating
- Circulation function
- Solid fuel boiler back-up heating
- Tube collector function
- Holiday (storage recool) function
- Anti-freeze function
- High degree of operational safety through fault diagnosis

Technical data



Temperature Differential Controller	TR 0603
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 3 W
Inputs	6 5 x temperature determination (Pt1000), 1 x temperature determination or pulse
Output	3 1 x switch output relay, 2 x triac for speed control
Number of preset hydraulic systems	15
Interfaces	RS232, IS-Bus
Operation temperature range	0 °C ... +45 °C
LCD-Display	animated LCD-Display with 2 colour backlight
Protection class	IP 20/DIN 40050
Dimensions l x w x h	170 x 170 x 46 mm



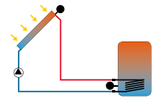
Display example
Here are merely a selection, designed to show the many and diverse function displays of the TR 0603 controller.

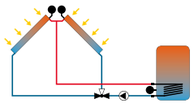
Graphical display

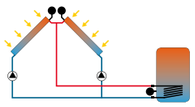
The fully animated graphical display of the TR 0603 controller is a new feature in the field of solar thermal controllers. With this display, Steca has managed to represent the different system layouts and numerous functions in a clearly laid out display that is easy to understand. This is supported by the ability to display information in a number of different languages. Apart from the usual high quality of all Steca products, the strength of this controller lies in the ease of use and the high level of functionality.

System examples

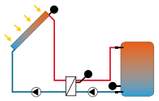
1-storage-tank systems

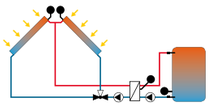

System with 1 storage tank

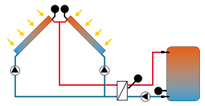

System with east/west roof, 1 storage tank and valve control


System with east/west roof, 1 storage tank and pump control

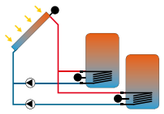
with external heat exchanger

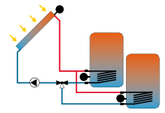

System with 1 storage tank and external heat exchanger

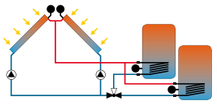

System with east/west roof and valve control, 1 storage tank and external heat exchanger

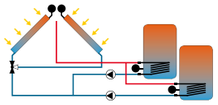

System with east/west roof and pump control, 1 storage tank and external heat exchanger

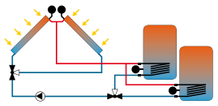
2-storage-tank systems


System with 2 storage tanks and pump control

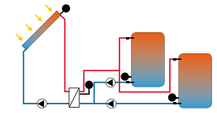

System with 2 storage tanks and valve control

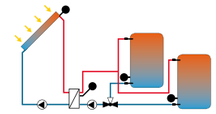

System with east/west roof and pump control, 2 storage tanks and valve control


System with east/west roof and valve control, 2 storage tanks and pump control

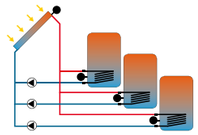

System with east/west roof and valve control, 2 storage tanks and valve control

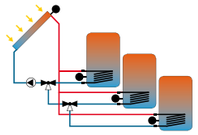
with external heat exchanger


System with 2 storage tanks, pump control and external heat exchanger


System with 2 storage tanks, valve control and external heat exchanger

3-storage-tank systems


System with 3 storage tanks and pump control


System with 3 storage tanks and valve control

Casing design
The well thought-out design allows easy installation and is particularly service-friendly.

Steca TR 0603mc

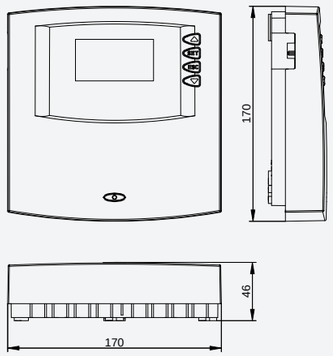
As the latest novelty the solar thermal controller TR0603mc combines the features of the already successful temperature differential controllers TR 0502 and TR 0603.

As a further highlight, the TR 0603mc stores the system's operational data on an SD card. The 40 pre-programmed systems and numerous additional functions allow universal use of the controller. The large display panel shows the animated control circuits, which allow you to view the operating conditions of each system. The TR 0603mc also has 6 inputs for recording temperature or pulse values, as well as an extra „Direct Sensor" input for combined temperature and flow rate measurement. Pumps and switching valves are controlled using 3 outputs, some of which can be RPM controlled.

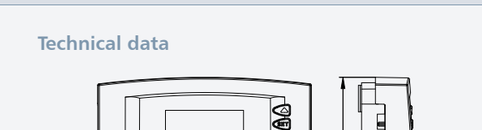
Product features:

- Backlight LCD-Display showing animated representation of the systems and their operating status
- Heating return increase
- Thermostat function
- Differential thermostat function
- Timer functions
- Heat meter (impulse generator / Direct Sensor)
- Circulation function (controlled by temperature / time / pulse)
- Back-up heating
- Solid fuel boiler back-up heating
- Tube collector function
- Holiday (storage recool) function
- Anti-freeze function
- Interval function
- Rapid loading of storage tank
- Reduction of system stagnation phases
- Anti-legionella function
- Fault reporting output
- Bypass switching
- Data logging on SD card
- Seasonal systems (loading of pool / storage tank according to the time of the year)
- High degree of operational safety through fault diagnosis
- Multi-language menu navigation

Technical data

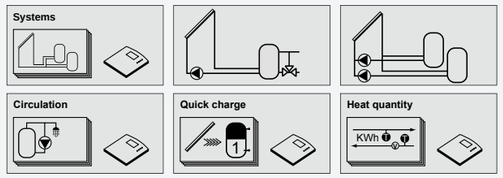


Temperature Differential Controller	TR 0603mc
System voltage	230 V (± 15%), 50 Hz [optional 115 V (± 15%), 60 Hz]
Max. own consumption	≤ 3 W
Inputs	6 5 x temperature recording (Pt1000), 1 x temperature recording (Pt1000) or pulse
Additional input	1 x Direct Sensor (temperature / flow rate)
Outputs	3 1 x relay switched output, 2 x triac output for RPM control
Additional output	1 x fault reporting output
Number of pre-defined hydraulic schemes	40
Interfaces	SD card, RS232
Data logging	SD card
Permitted ambient temperature	0 °C ...+45 °C
Display	animated graphic LCD with 2 colour backlight
Protection degree	IP 20 / DIN 40050
Weight	450 g
Dimensions l x w x h	170 x 170 x 46 mm



Graphic display

The new TR 0603mc solar thermal controller is also equipped with a fully animated graphic display. This serves to represent the different system layouts and numerous functions in a clearly laid out display that is easy to understand. The strength of this controller lies in its ease of use and high level of functionality.



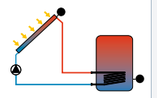
Display examples

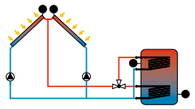
Data logging on SD card

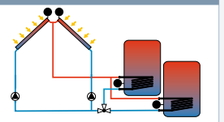
The TR 0603mc stores the solar thermal system's operational data on an SD card. This can be used for evaluation purposes.

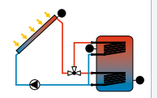
System examples

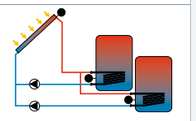
Systems with internal heat exchanger

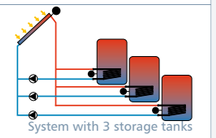

System with 1 storage tank

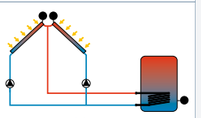

System with east/west roof, 1 storage tank (2 Charging level)

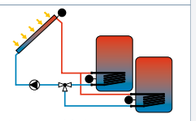

System with east/west roof and 2 storage tanks

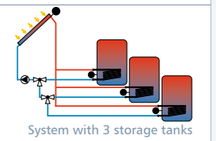

System with 1 storage tank (2 Charging level))


System with 2 storage tanks and pump control

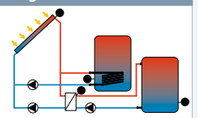

System with 3 storage tanks and pump control

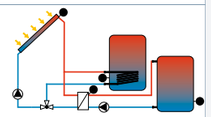

System with east/west roof and 1 storage tank


System with 2 storage tanks and valve control

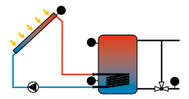

System with 3 storage tanks and valve control

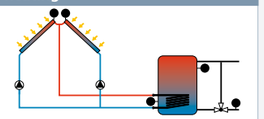
Heat exchange external/internal

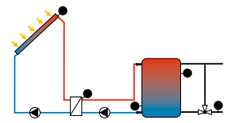

System with 2 storage tanks and pump control

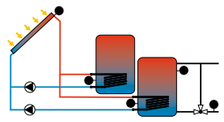

System with 2 storage tanks and valve control

with additional heating

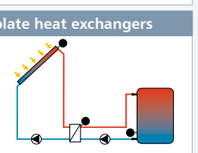

System with 1 combined storage tank and additional heating

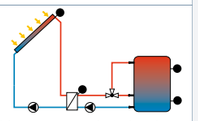

System with east/west roof, 1 storage tank and additional heating

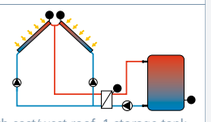

System with 1 combined storage tank, additional heating and external heat exchanger

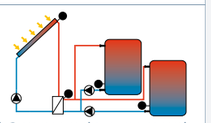

System with 2 storage tanks, additional heating and pump control

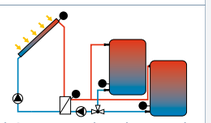
with plate heat exchangers

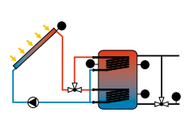

System with 1 storage tank and external heat exchanger

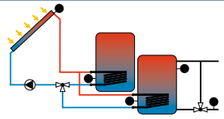

System with 1 storage tank (2 charging level) and external heat exchanger


System with east/west roof, 1 storage tank and external heat exchanger

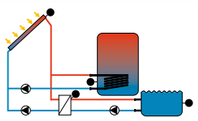

System with 2 storage tanks, pump control and external heat exchanger

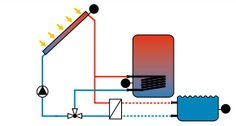

System with 2 storage tanks, valve control and external heat exchanger

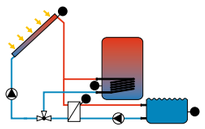

System with 1 storage tank (2 charging level) and additional heating

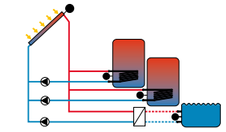

System with 2 storage tanks, additional heating and valve control

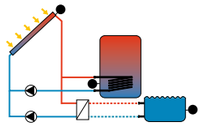
Systems with swimming pool

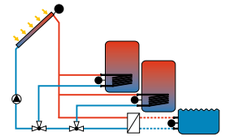

System with 1 storage tank, swimming pool and pump control


System with 1 storage tank, independent swimming pool circulation and valve control


System with 1 storage tank, swimming pool and valve control


System with 2 storage tanks, independent swimming pool circulation and pump control


System with 1 storage tank, independent swimming pool circulation and pump control


System with 2 storage tanks, independent swimming pool circulation and valve control

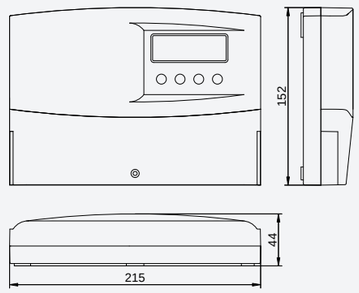
Steca TR 0704

The TR 0704 system controller is a universal controller for solar energy and heating systems. In addition to a selection of pre-programmed basic systems, freely programmable individual system configurations can also be realised. The standard TR 0704 has three heat volume measurement inputs and an hours-of-operation logger for each of the four controller outputs. A special feature is the ability to not only display the current values of temperature, irradiation and energy volumes, but also to display the accumulated values over several days in the form of a graphical curve via a graphical dot matrix LCD-Display. The modular construction of the TR 0704 system controller allows the control system to be expanded with up to four extra TA 0403 I/O modules. Every extra I/O module has its own microprocessor with four temperature recording inputs and three switching outputs, some of which can also be speed controlled. This means that the controller can be expanded at any time to a maximum of 23 inputs and 16 outputs. The basic version of the TR 0704 system controller has seven inputs for temperature, irradiation or flow rate recording and four outputs for controlling circulation pumps or switching valves. Communication with external peripherals is provided by an IS bus, a fault message output and an RS232 interface.

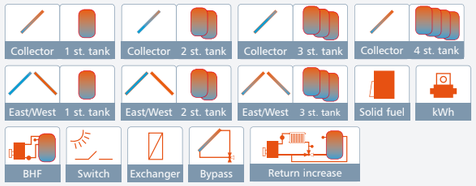
Features

- Measurement display on a graphical dot matrix display
- Storage of measured values by an integrated data logger
- Freely selectable pre-programmed basic systems
- Remote data transfer and remote parameter setting
- User-friendly programmability
- Heat meter and hours-of-operation logger
- Can be modularly extended with the TA 0403 using the data bus interface
- Electronic speed control
- Menu-driven LCD-Display

Technical data

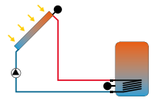


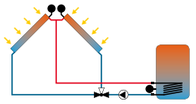
Temperature Differential Controller	TR 0704
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 3 W
Inputs	7 2 x temperature determination (Pt1000) or radiation inputs 5 x temperature determination (Pt1000) or pulse detection for calorimetry
Outputs	4 2 x triac for speed control, max. 250 W (R1), 480 W (R2) [230 V] 2 x switch output relay, max. 800 W (R3+R4) [230 V] or R4 voltage free
Turn-on temperature difference	4 ... 17 K
Turn-off temperature difference	2 ... 15 K
Operation temperature range	0 °C ... +45 °C
Display	graphic display
Protection class	IP 20/DIN 40050
Weight	570 g
Dimensions l x w x h	150 x 215 x 44 mm

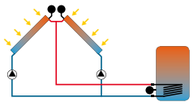


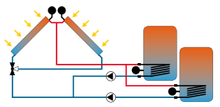
System examples

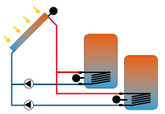
Systems with internal heat exchanger

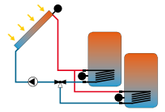

System with 1 storage tank

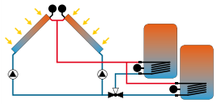

System with east/west roof, 1 storage tank and valve control

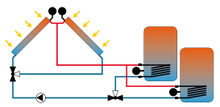

System with east/west roof, 1 storage tank and pump control

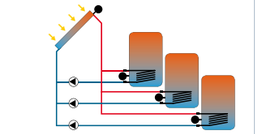

System with east/west roof and valve control, 2 storage tanks and pump control

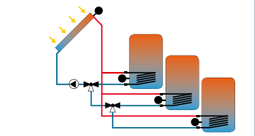

System with 2 storage tanks and pump control

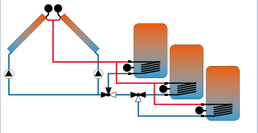

System with 2 storage tanks and valve control

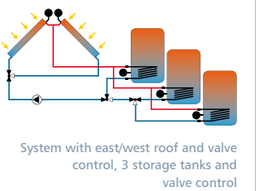

System with east/west roof and pump control, 2 storage tanks and valve control

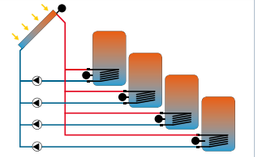

System with east/west roof and valve control, 2 storage tanks and valve control

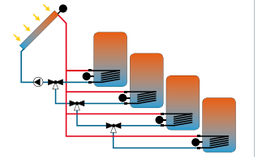

System with 3 storage tanks and pump control


System with 3 storage tanks and valve control

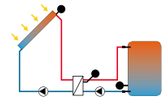

System with east/west roof and pump control, 3 storage tanks and valve control

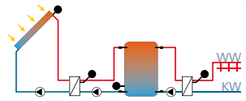

System with east/west roof and valve control, 3 storage tanks and valve control


System with 4 storage tanks and pump control

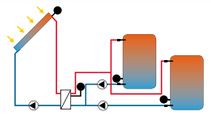

System with 4 storage tanks and valve control

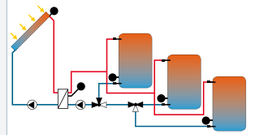
with plate heat exchangers

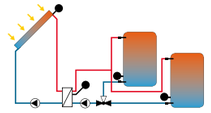

System with 1 storage tank and external heat exchanger

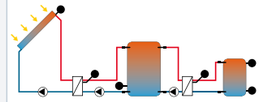


System with 1 storage tank, external heat exchanger and fresh water function

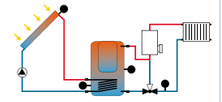

System with 2 storage tanks, pump control and external heat exchanger

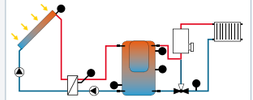

System with 3 storage tanks, valve control and external heat exchanger

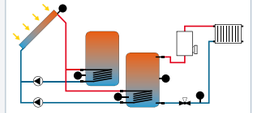

System with 2 storage tanks, valve control and external heat exchanger


System with 1 storage tank, external heat exchanger with preheating tank

Additional heating


System with 1 combined storage tank


System with 1 combined storage tank and external heat exchanger


System with 2 storage tanks and pump control

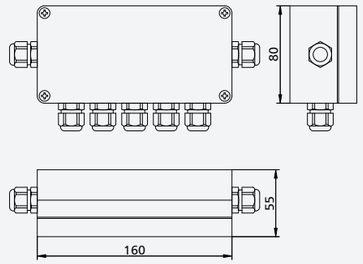
Steca TA 0403

The TA 0403 expansion module, with freely programmable functions and extra inputs / outputs, was specially developed to extend the range of applications of our TR 0704 system controller. The TA 0403 module has 4 sensor inputs and 3 outputs, some of which can be speed controlled. TR 0704 system controller provides the control signals and supply voltage via the Steca IS bus. All functions and control parameters of the TA 0403 can be set using the user-friendly menu system of the system controller. Up to four TA 0403 modules can be driven by a single TR 0704 system controller over the IS data bus. The operator of the solar system then has the possibility of realising individual systems with up to 23 inputs and 16 outputs. Existing systems can be extended at any time through the use of extra TA 0403 modules in conjunction with a TR 0704 system controller.

Features

- 4 temperature / pulse recording inputs and 3 outputs, some of which can be speed controlled
- Steca IS bus networking with the TR 0704 allows the realisation of individual systems with up to 23 inputs and 16 outputs
- Measurement display on the TR 0704 graphical display
- User-friendly programming of the inputs / outputs by using the TR 0704 menu system
- The TR 0704 provides control signals and voltage over the Steca IS bus
- IP 65 protective case

Technical data



Add module for TR 0704	TA 0403
System voltage	230 V (± 15 %), 50 Hz [optional 115 V (± 15 %), 60 Hz]
Max. own consumption	≤ 1,5 W
Inputs	4 4 x temperature determination (Pt1000) or pulse detection for calorimetry
Outputs	3 1 x triac for speed control, max. 200 W (R1) [230 V] 2 x switch output relay, max. 800 W (R2+R3) [230 V]
Temperature sensor Pt1000	1.5 m silicon cable; measuring 180 °C
Operation temperature range	0 °C...+45 °C
Display	-
Protection class	IP 65 / DIN 40050 / EN 60529
Weight	350 g
Dimensions l x w x h	160 x 80 x 55 mm

Examples of application for the expansion module

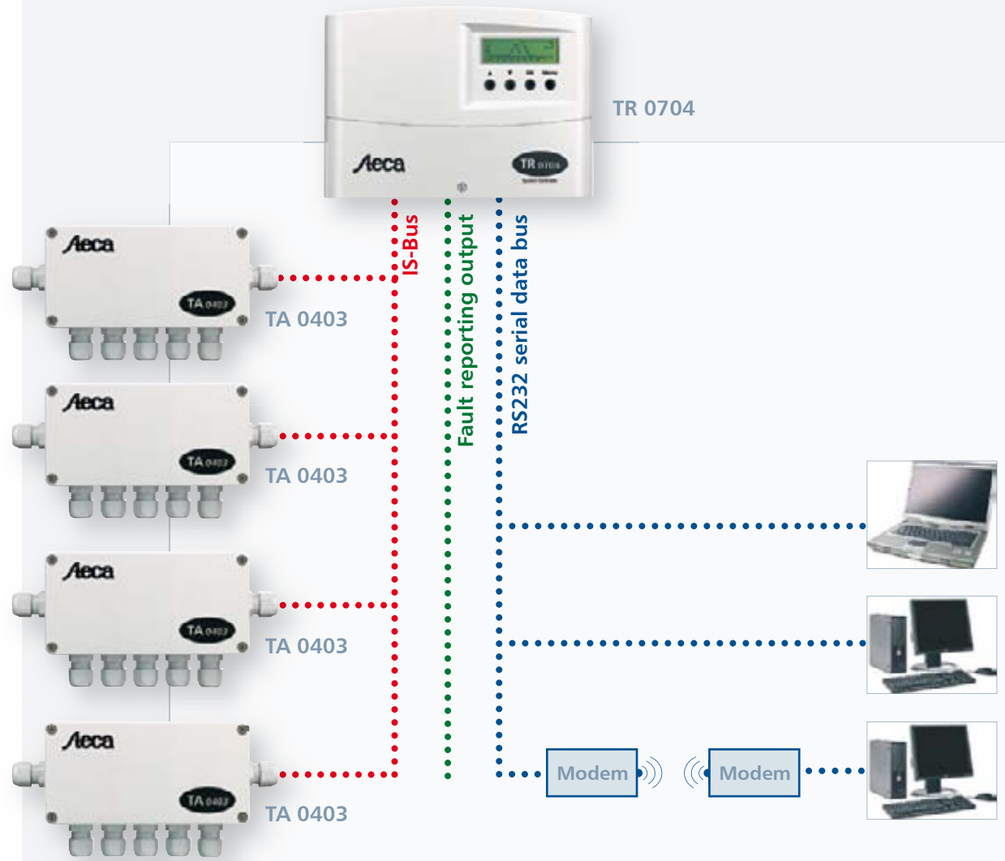


Fig 1: Schematic representation of the control system

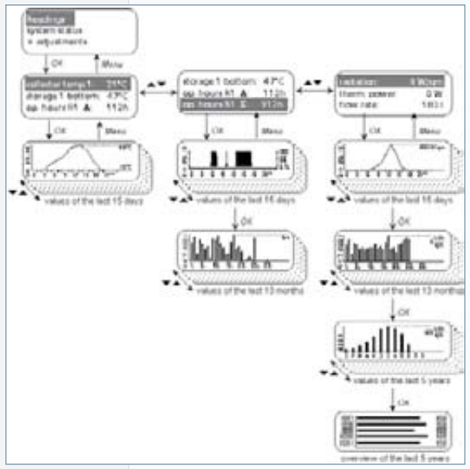


Fig 2: Data logger graphics and the menu structure of the TR 0704 controller

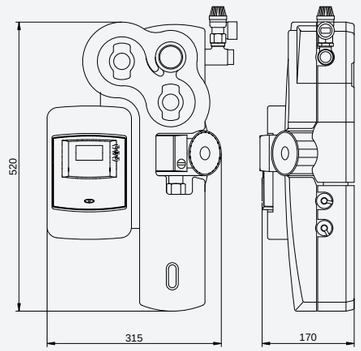
Data recording and visualisation of measurement data

All measured values recorded from the TA 0403 expansion module(s) can also be graphically represented on the TR 0704 system controller display. A generously dimensioned data storage system allows the measured values from the last 15 days to be displayed in the form of a graphical curve. The running times of the pumps over the last 15 days, or even the last 13 months, can also be graphically displayed for analysis. The irradiation, output and flow values can also be displayed over the following periods: 15 days, 13 months, the last 5 years, and a 5 year total overview.

TPS 20

The two-string solar station TPS 20 is a complete pre-assembled hydraulic unit with integrated Steca controller TR 0301. The pump assembly is the connecting link between the solar collector system and the hot water storage tank, and includes all fittings and safety devices for safe and long-lasting operation of a solar thermal system. Complete prefabrication enables quick and easy installation of all system hydraulics. With the aid of a newly developed flow rate display, and an inspection glass made of borosilicate glass, the present flow rate is always indicated. For increased operational safety of the system, an optional integrated air scoop can be used as a continuous air separator in the supply circuit. The standard is a Wilo Star ST20/6 solar thermal pump with an installation length of 130 mm. Alternatively, other pump types with G1 threaded connectors (e.g. Wilo Star ST20/7) are available at extra cost. The supply circuit and the circulation pump can be shut off completely, so that it is not necessary to empty the entire solar energy system for servicing or pump replacement. In keeping with our high quality standards, all fluid-carrying components are brass and completely screw-fitted.

Technical data



Solar station	TPS 20
Nominal size	DN 20
Circulation pump	Wilo Star ST20/6 (optional e.g. ST20/7)
Fittings	brass
Seals	Klingersil /EPDM
Insulation	expanded polypropylene (EPP)
Max. pressure	10 bar
Max. temperature	120 °C, temporarily 160 °C
Gravity brakes	supply and return, installable 2 x 200 mm wc = 400 mm wc total
Flow display	1 - 20 l/min
Safety valve	6 bar, for solar thermal systems
Manometer	0 - 6 bar, high-temp. resistant
Thermometer	0 - 160 °C, full metal
Connections	¾" external thread
Centre distance	90 mm
Dimensions incl. insulation l x w x h	520 x 315 x 170 mm

Features

- DN 20 solar station with integrated Steca controller TR 0301
- Standard pump: Wilo Star ST20/6 (e.g. ST20/7, available at extra cost)
- Full metal dial thermometer 0 - 160 °C for supply and return
- Newly developed flow display from 1 – 20 l/min.
- 6 bar safety valve, approved for solar energy systems
- 0 - 6 bar manometer, high-temperature resistant, full metal with shut-off valve
- Gravity brakes in supply and return, made of solid brass, can be installed with shut-off ball valve
- Integrated air scoop for continuous air separation during operation
- Integrated and easy-to-use flushing and filling unit before the pump, via emptying taps
- Elastic design heat insulation made of expanded polypropylene (EPP), can be used at up to 120 °C and for short periods up to 160 °C, 100 % insulation of fittings with very good ventilation and cooling of the pumps
- Wall-mounting with steel wall bracket for very easy installation
- ¾" connections, external threads, flat sealing
  - Simple stainless steel corrugated pipe connection on the collector side flat sealing ¾" or
  - Cutting ring screw connection DN 20-18mm Cu or DN 20-15mm Cu or
  - Commercially available fittings

Solar station varieties

TPS 20 AF

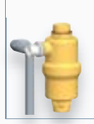
complete with:

- Wilo Star ST20/6 pump
- TPA A-20 Air separator
- TPA F-20 Flow display

TPS 20

with controller TR 0301

inclusive		type
X	X	TPS 20 AFR31
X	-	TPS 20 AR31
-	X	TPS 20 FR31
-	-	TPS 20 R31
Air separator	Flow display	



TPS 20

without controller

inclusive		type
X	X	TPS 20 AF
X	-	TPS 20 A
-	X	TPS 20 F
-	-	TPS 20
Air separator	Flow display	

Solar station accessories

TPA ADG 3/4"

¾" connection set for expansion vessel

For connection to the ¾" safety set; stainless steel corrugated hose ¾" int. thread – int. thread x 500 mm, wall bracket with fixing materials, for max. vessel Ø = 440 mm

TPA FPA

Hand pump, filling pump and injection pump

External thread = ½", 15mm hose connection, with additional emptying tap, attainable pressure up to approx. 4 bar, length 225 mm

TPA A-20

Air separator DN 20

Specially developed for continuous degasification of the heat-transfer fluid of solar energy systems. Optimal installation site: in the supply of the collector within the solar station. Separated air builds up in the air separator, and can be released occasionally by hand. This is particularly advisable when using stainless steel corrugated pipes in order to completely bleed the system.

130 mm x 75 mm; air stop: Ø 60 mm

Dimensions l x w:

130 mm x 75 mm; air stop: Ø 60 mm

Connections:

2 x 3/4" external thread connections

TPA F-20

Flow display DN 20

Flow rate measuring device with functional inspection, can be used at up to 120 °C in „cold" return, measuring range 1-20 L/min

Dimensions l x w:

106 x 40 mm

Connections:

Top 1" internal thread (union nut), bottom ¾" external thread

TPA SVS-2015

Cutting ring screw connection set

Suitable for TPS 20 solar station, 2 connections packed as a set, made of brass,for Cu pipe Ø 15 mm, with ¾" nut

TPA SVS-2018

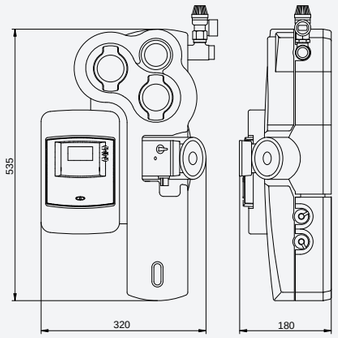
Cutting ring screw connection set

Suitable for TPS 20 solar station, 2 connections packed as a set, made of brass, for Cu pipe Ø 18 mm, with ¾" nut

TPS 25

The two-string solar station TPS 25 is a complete pre-assembled hydraulic unit with integrated Steca controller TR 0301. The pump assembly is the connecting link between the solar collector system and the hot water storage tank, and includes all fittings and safety devices for safe and long-lasting operation of a solar thermal system. Complete prefabrication enables quick and easy installation of all system hydraulics. With the aid of a newly developed flow rate display, and an inspection glass made of borosilicate glass, the present flow rate is always indicated. For increased operational safety of the system, an optional integrated air scoop can be used as a continuous air separator in the supply circuit. The standard is a Wilo Star ST25/6 solar thermal pump with an installation length of 180 mm. Alternatively, other pump types with G1½ threaded connectors (e.g. Wilo Star ST25/7) are available at extra cost. The supply circuit and the circulation pump can be shut off completely, so that it is not necessary to empty the entire solar energy system for servicing or pump replacement. In keeping with our high quality standards, all fluid-carrying components are brass and completely screw-fitted.

Technical data



Solar station	TPS 25
Nominal size	DN 25
Circulation pump	Wilo Star ST25/6 (optional e.g. ST25/7)
Fittings	brass
Seals	Klingersil / EPDM
Insulation	expanded polypropylene (EPP)
Max. pressure	10 bar
Max. temperature	120 °C, temporarily 160 °C
Gravity brakes	supply and return, installable 2 x 200 mm wc = 400 mm wc total
Flow display	5 - 40 l/min
Safety valve	6 bar, for solar thermal systems
Manometer	0 - 6 bar, high-temp. resistant
Thermometer	0 - 160 °C, full metal
Connections	1" external thread
Centre distance	90 mm
Dimensions incl. insulation l x w x h	535 x 320 x 180 mm

Features

- DN 25 solar station with integrated Steca controller TR 0301
- Standard pump: Wilo Star ST25/6 (e.g. ST25/7, available at extra cost)
- Full metal dial thermometer 0 - 160 °C for supply and return
- Newly developed flow display from 5 – 40 l/min.
- 6 bar safety valve, approved for solar energy systems
- 0 - 6 bar manometer, high-temperature resistant, full metal with shut-off valve
- Gravity brakes in supply and return, made of solid brass, can be installed with shut-off ball valve
- Integrated air scoop for continuous air separation during operation
- Integrated and easy-to-use flushing and filling unit before the pump, via emptying taps
- Elastic design heat insulation made of expanded polypropylene (EPP), can be used at up to 120 °C and for short periods up to 160 °C, 100 % insulation of fittings with very good ventilation and cooling of the pumps
- Wall-mounting with steel wall bracket for very easy installation
- 1" connections, external threads, flat sealing
  - — Simple stainless steel corrugated pipe connection on the collector side flat sealing 1" or
  - — Cutting ring screw connection for CU pipe Ø 18mm, with 1" nut with support sleeve or CU pipe Ø 22mm, with 1" nut with support sleeve, or
  - — Commercially available fittings

Solar station varieties

TPS 25 AF

complete with:

- pump
- TPA A-25 Air separator
- TPA F-25 Flow display

TPS 25

with controller TR 0301

inclusive		type
X	X	TPS 25 AFR31
X	-	TPS 25 AR31
-	X	TPS 25 FR31
-	-	TPS 25 R31
Air separator	Flow display	

TPS 25

without controller

inclusive		type
X	X	TPS 25 AF
X	-	TPS 25 A
-	X	TPS 25 F
-	-	TPS 25
Air separator	Flow display	

Solar station accessories

TPA ADG 3/4"

¾" connection set for expansion vessel

For connection to the ¾" safety set; stainless steel corrugated hose ¾" int. thread – int. thread x 500 mm, wall bracket with fixing materials, for max. vessel Ø = 440 mm

TPA FPA

Hand pump, filling pump and injection pump

External thread = ½", 15 mm hose connection, with additional emptying tap, attainable pressure up to approx. 4 bar, length 225 mm

TPA A-25

Air separator DN 25

Specially developed for continuous degasification of the heat-transfer fluid of solar energy systems. Optimal installation site: in the supply of the collector within the solar station. Separated air builds up in the air separator, and can be released occasionally by hand. This is particularly advisable when using stainless steel corrugated pipes in order to completely bleed the system.

Dimensions l x w:
180 x 85 mm; air stop: Ø 70 mm

Connections:
2 x 1"external thread connections

TPA F-25

Flow display DN 25

Flow rate measuring device with functional inspection, can be used at up to 120 °C in „cold" return, measuring range 1-20 l/min

Demensions l x w:
95 x 42 mm

Connections:
2 x 1" external thread connections

TPA SVS-2518

Cutting ring screw connection set

Suitable for TPS 25 solar station, 2 connections packed as a set, made of brass, for Cu pipe Ø 18 mm, with 1" nut

TPA SVS-2522

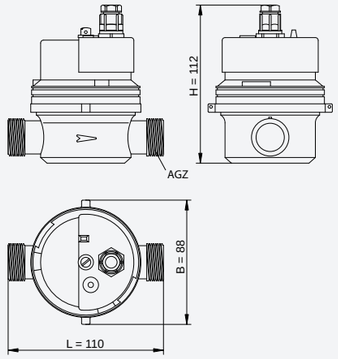
Cutting ring screw connection set

Suitable for TPS 25 solar station, 2 connections packed as a set, made of brass, for Cu pipe Ø 22 mm, with 1" nut

Steca TA VM1

The TA VM1 flow rate measurement component allows flow rate measurement of the water/water-glycol heat transfer fluid. A contact sensor (e.g. reed relay) is used to send a pulse to the solar controller (e.g. Suntana / Suntana 2 / TR 0603 / TR 0704) every time a defined quantity of fluid passes through the system (e.g. 1 litre = 1 pulse). At the same time, the controller determines the temperature difference between the supply and return temperatures and then calculates the quantity of heat generated, by using this difference, the flow rate and the specific material characteristics of the heat transfer fluid. The heat volume calculated is then finally stored in the controller and displayed as kWh.

Technical data



Flow meter	
Pulse rate	1 l/pulse
Nominal diameter DN	15
Max. operating temperature Tmax	120 °C
Max. operating pressure PN	16 bar
Nominal flow Qn	1.5 m³/h
Max. flow Qmax	3 m³/h
Connecting threads on meter body according ISO 228/1 (AGZ - Inch)	G ¾ B
Connecting threads of couplings according DIN 2999 (AGV - Inch)	R ½
Length l	110 mm
Width w	88 mm
Height h	112 mm
Weight without couplings	0.8 kg

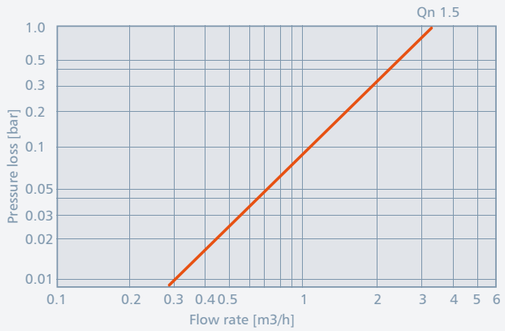
Features

- Nominal size: DN 15
- Nominal flow rate Qn: 1.5 m³/h
- Pulse rate: 1 l/Imp.
- Maximum operating temperature: 120 °C
- Operating pressure: up to 16 bar according to DIN 2401
- Installation and connection dimensions according to DIN ISO 4064
- For horizontal and vertical installation
- Hard-metal bearings up to 120 °C
- Contact loading: 24 V (without series resistor)
- Cable length: 3 m

Special features

- This series is equipped with special hard-metal, dry-running bearings for the through-flow paddle counter, it uses magnetic coupling and has been conceived according to the latest technology.
- To avoid disturbances caused by unclean water, only the paddle wheel sits in the fluid path.
- The roller counter is evacuated and sealed against dust and water to avoid cracking the glass pane under extreme temperature fluctuations.
- The counter can be rotated for easier reading.

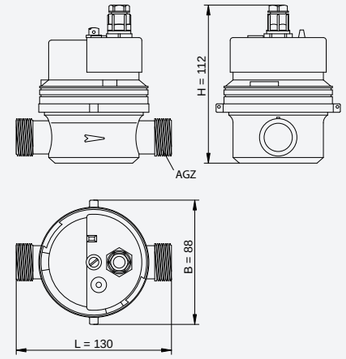
Pressure loss curve



Steca TA VM2

The TA VM2 flow rate measurement component allows flow rate measurement of the water/water-glycol heat transfer fluid. A contact sensor (e.g. reed relay) is used to send a pulse to the solar controller (e.g. Suntana / Suntana 2 / TR 0603 / TR 0704) every time a defined quantity of fluid passes through the system (e.g. 10 litre = 1 pulse). At the same time, the controller determines the temperature difference between the supply and return temperatures and then calculates the quantity of heat generated, by using this difference, the flow rate and the specific material characteristics of the heat transfer fluid. The heat volume calculated is then finally stored in the controller and displayed as kWh.

Technical data



Flow meter	
Pulse rate	10 l/pulse
Nominal diameter DN	20
Max. operating temperature Tmax	120 °C
Max. operating pressure PN	10 bar
Nominal flow Qn	2.5 m³/h
Max. flow Qmax	5 m³/h
Connecting threads on meter body according ISO 228/1 (AGZ - Inch)	G 1 B
Connecting threads of couplings according DIN 2999 (AGV - Inch)	R ¾
Length l	130 mm
Width w	88 mm
Height h	112 mm
Weight without couplings	1.0 kg

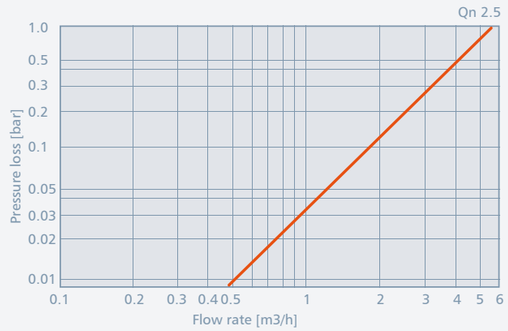
Features

- Nominal size: DN 20
- Nominal flow rate Qn: 2.5 m³/h
- Pulse rate: 10 l/Imp.
- Maximum operating temperature: 120 °C
- Operating pressure: up to 10 bar according to DIN 2401
- Installation and connection dimensions according to DIN ISO 4064
- For horizontal and vertical installation
- Hard-metal bearings up to 120 °C
- Contact loading: 24 V (without series resistor)
- Cable length: 3 m

Special features

- This series is equipped with special hard-metal, dry-running bearings for the through-flow paddle counter, it uses magnetic coupling and has been conceived according to the latest technology.
- To avoid disturbances caused by unclean water, only the paddle wheel sits in the fluid path.
- The roller counter is evacuated and sealed against dust and water to avoid cracking the glass pane under extreme temperature fluctuations.
- The counter can be rotated for easier reading.

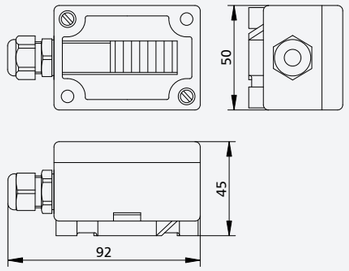
Pressure loss curve



Steca TA ES1

The TA ES1 irradiation sensor is based on a monocrystalline silicon solar cell and allows recording of the current level of solar irradiation. The silicon solar cell is laminated into a weatherproof, transparent, UV-resistant plastic lid. The sensor is connected using high-strength cable glands and cage clamps. The TA ES1 sensor can be used as a so-called „irradiation threshold switch" to switch the solar circuit pump on and off, based on the current level of solar irradiation. Alternatively, the recording of the level of solar irradiation can be used for monitoring and analysis of the solar energy system. The sensor is delivered with a 3 m long, 2-core, UV-resistant connection cable. The case has pre-drilled holes for screw mounting and also an opening for strap mounting.

Technical data



Irradiation sensor	TA ES1
Dimensions solar cell	4.5 cm²
Dimensions case	70 x 70 x 45 mm²
Max. length of connecting cable	
with a cable cross-section of 1.5 mm²	20 m
with a cable cross-section of 2.5 mm²	33 m
Cable length (UV resistant) included in delivery	3 m

Features

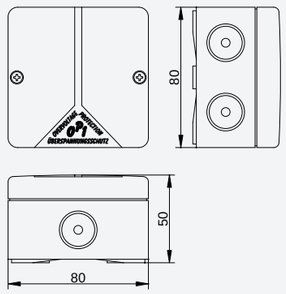
- Installation: Horizontal and sloping
- Uncertainty: ±5 % annual mean
- Weatherproof, UV-resistant case
- Useable as:
  - — Irradiation threshold switch
  - — Visualisation of irradiation intensity

Steca TA OP1

The TA OP1 overvoltage protection unit is a connection socket in a splash-proof IP 65 protective case and serves to protect the collector sensors against local lightning strikes and externally induced voltage spikes.

A varistor protective diode protects against atmospheric voltage spikes that can lead to destruction of the collector sensors. The use of the TA OP1 offers extra general protection of the collector sensors in any type of solar thermal system. In addition, the simple operation of the coil-spring clamps allows rapid and simple installation of the collector sensors using a sensor extension cable.

Technical data



Overvoltage protection	OP1
Operation temperature range	-25 °C...+70 °C
Protection class	IP 65 / DIN 40050
Weight	50 g
Dimensions l x w x h	80 x 80 x 50 mm

Features

- Spring-coil clamps allow rapid, easy installation
- Splash-proof case with IP 65 protection
- Varistors provide secure protection against local lightning strikes and externally induced voltage spikes

Steca Pt1000

Immersion sensor

Immersion sensors allow temperature recording in liquid and gaseous media and are designed for installation in existing or on-site immersion sleeves.

Features

- For installation in immersion sleeves

Steca Pt1000-RAF

Pipe sensor

The Pt1000-RAF is a pipe sensor, with tensioning band and axial sensor pipe, for temperature recording at ducts and pipes (e.g. cold and warm water pipes), or at heating loops.

Features

- For fastening to pipes, including pipe clamp

Immersion sensor	Pt1000 class B
Measuring range	-50 °C ... +180 °C
Diameter Ø	6 mm
DIN IEC 751	
Silicon cable	1500 mm
Bushing length	50 mm
Bushing material	Stainless steel

Pipe sensor	Pt1000-RAF
Measuring range	-50 °C ... +180 °C
Diameter Ø	6 mm
DIN IEC 751	
Silicon cable	3000 mm
Length x Diameter Ø	20 mm x Ø 15 mm
Bushing material	Aluminium

Steca Pt1000-MWT

Sheathed resistance thermometer

The properties of the Pt1000-MExchanger sheathed resistance thermometer make it suitable for use in all measurement locations where an application specific installation length, and trouble free exchange of the units, is desired. The good heat transfer between the protective pipe and the temperature sensor allows short response times and high measurement accuracy. The standard measurement unit contains a Pt1000 temperature sensor, according to DIN EN 60 751 class B, with a two-core switch.

Features

- Adjustable immersion depth using a screwed clamping ring

Sheathed resistance thermometer	Pt1000-MWT
Measuring range	-10 °C ... +105 °C
Diameter Ø	4.5 mm
DIN IEC 751	
PVC-cable	2000 mm
Length	350 mm
Bushing material	Stainless steel
Terminal screw connection	G 1/4"
Material of terminal screw connection	Stainless steel
Material of clamping ring	Stainless steel

The dramatic reports on world climate have given people a wake-up call. We are reaching the critical time in the battle to avoid a climate catastrophe. Steca was quick to recognise the significance of regenerative energies in contributing to climate protection: The company, with the headquarters in Memmingen, has made itself a front runner in the development of high-performance green technologies to harness the inexhaustible energy potential of the sun.

Steca – The Company

Products and solutions for an ecological future.

As a leading supplier of products for the solar electronics industry, Steca sets the international standard for the regulation and control of solar energy systems. In the three market segments photovoltaics, solar home systems, and stand-alone systems; in grid feeding and in solar thermal energy, Steca is synonymous with innovation and vision. In conception, development, production and marketing, the company is committed to the highest quality standards. Its focus is on made-to-measure solutions for the effective utilisation of solar radiation. By participating in international research projects at leading institutions and universities, Steca is pushing forward the further development of solar energy.

Active climate protection by promoting regenerative energy sources constitutes the basis of all of Steca's activities. The company's declared goal is to develop today the technologies of tomorrow, and to permanently reduce CO_2 emissions. Furthermore, Steca continually examines the technologies developed with a view to simple operation, consequently and usability for the wide base of the population - worldwide.

Steca Electronics

Solar electronics – made by Steca

30 years of Steca Electronics

Steca – The EMS provider

Service around the theme electronics

Regional and international

Environmental and climate protection

Protection of the environment has many aspects for Steca Electronics. In addition to the clear need to apply environmentally-friendly manufacturing processes in its electronics production, Steca was developing energy-saving electronics for the household market long before this was even a subject of discussion for the industry and public. In the meantime Steca electronics continuous to contribute significantly to reducing the energy consumption of household devices. Products in the area of solar electronics facilitate environmentally-friendly use of clean and free solar energy. Today, one million solar controllers manage and control solar energy systems all over the world, with an output of 100 MWp.

The constant development of new technologies makes Steca to the leading supplier of solar electronics.

Solar electronics – made by Steca

The highest standards of quality are ensured through the interaction of a single company's research and development, production, operation, and quality control.

Quality management

Steca guarantees top quality, safety and reliability, and places considerable emphasis on environmental compatibility during the development, construction, manufacture and distribution of our products.

Steca is certified according to:

- DIN EN ISO 9001:2000
- DIN EN ISO 14001:2004

and audited according to

- TS 16949
- VDA 6.3

A multitude of additional quality certifications from various institutions around the world reflect the outstanding quality of our products. Steca's solar charge controllers are certified for all World Bank projects.

Research and development

Fraunhofer Institut Solare Energiesysteme

For Steca, research is an important basis for continuing to provide our customers with innovative products in the future. To this end, Steca works with leading renewable energy research institutes all over Europe, such as the Fraunhofer Institute for Solar Energy Systems. This has made Steca the global technological leader in intelligent solar electronics technology. The charge-state algorithm, used in the patented AtonIC processor for the last ten years, and the optimised Hybrid Charging technology are only a few examples.

Our highly motivated development team researches new technologies and brings product ideas to reality. Our state of the art laboratories allow us to achieve optimal results. An integrated project management system helps us to monitor and check all development steps.

Precision and detail

StecaGrid inverters consist of numerous components that are matched to each other in the smallest details. Precision, from development to production, is a precondition for the creation of a high-quality product with a long service life.

Design and innovation

A modern, timeless exterior with innovative precision technology inside are the hallmarks of products developed for decades of use.

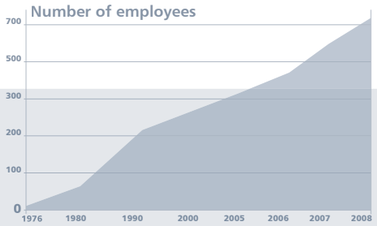
Neutral and independent

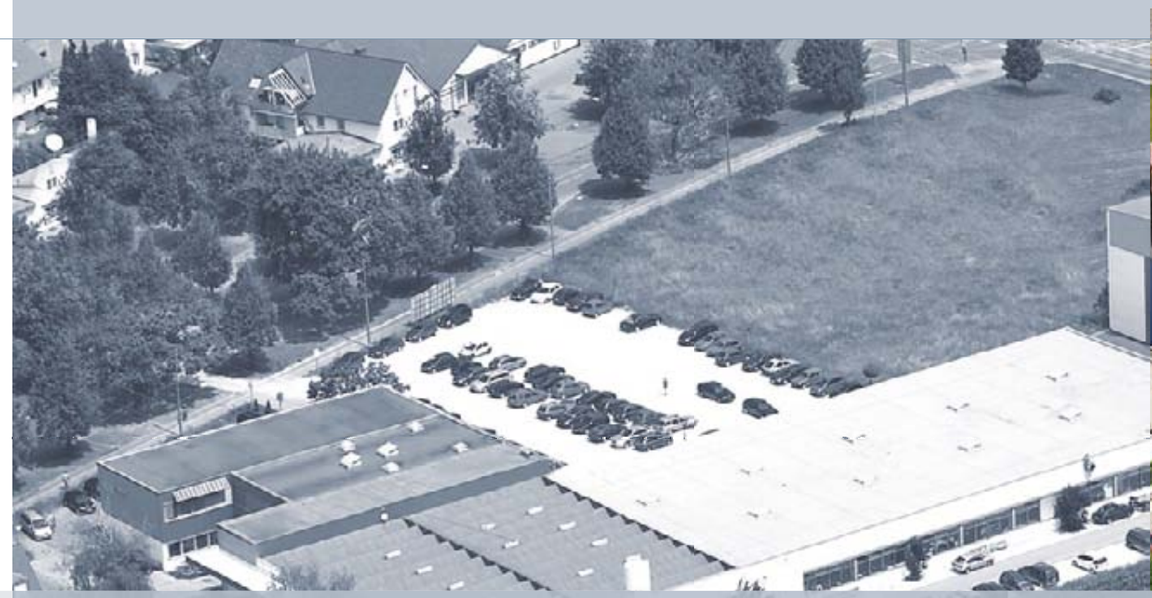
Steca is 100 % neutral and independent. Since we concentrate on development and production in the field of solar electronics, and choose not to deal in other components such as solar modules and batteries, we are in a position to sell our products to all market participants. All of our customers therefore profit from the way our business is scaled, via our impressive price/performance ratio.

Steca in figures

Number of component groups produced per year:	3.8 Mio.
Number of component groups supplied daily:	18,000
Number of component group types produced per year:	3,000
Number of production orders continuously being processed:	600
Number of components that are fitted onto printed circuit boards per hour:	50,000
Number of components that are fitted per year on average:	230 Mio.
Number of employees in 1976:	3
Number of employees in 2007:	540
Number of employees planned for 2008:	650

Production information relates to average orders and production capacity from the years 2006/2007





30 years of Steca Electronics

History and development

Today Steca can look back at over 30 years of history. Since it was founded in 1976, the company has been on a constant route to success.

1976 — **The company is founded. It assembles battery systems, and develops and produces battery charging systems.**

1980 — **The company has developed into a significant professional electronics supplier.**

1990 — **The company is expanded to include product ranges for cable systems and solar electronics with an own product line.**

The company is expanded into a full-service electronics service provider.

2000 — **The area of the production premises for development and manufacture is increased to 10,000 m².**

2005 — **The solar division is expanded with the grid-feed inverter product line.**

Steca thereby becomes the only company in the world that develops, manufactures and sells its own complete product programme for the regulation and control of solar energy systems.

Factory II is commissioned, with a production area of 3,500 m².

2006 — **A production site is opened in Bulgaria, with a production area of 5,000 m²**

... and a course set for a successful future.

2007 — **Factory III is commissioned, with a production area of 3,500 m².**

2008 2009 — **Further construction plant at Memmingen**

Steca's innovations in electronics development

Over the years, Steca has repeatedly provided impulses in the electronics field through innovative developments.

Here are few current examples:

Intelligent battery charging.

The first battery charging system with equalization charging.
With this system, Steca increases the service life of batteries connected in series using only a single charger.

SOC – State of Charge.

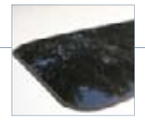
The specially developed adaptive SOC charging process ensures a gentle charging of the battery that increases the battery lifetime.

Pave the way in energy efficiency

In the times when energy efficiency was not even a topic for discussion, Steca set new standards by developing the first electronics with class A energy efficiency. These days, A++ is standard for us.

Graphical animated display

While the market still uses normal displays, Steca offers the first solar thermal controller with a graphical animated solar circuit display.
An innovation that has now been copied by many other manufactures.



Exclusive accessories for exclusive cars

For exclusive cars, we are the first manufacturer in the world to offer electronic systems that transform a clear glass pane into a translucent or tinted pane.

For difficult environments, ...

... Steca has been able to develop reliable component groups that satisfy these requirements. These products are among the first of their kind.

The third dimension

When electronic and mechanical systems must be connected in tight spaces, we develop and produce in the third dimension.

Fully graphical display

Another innovation is the first solar thermal controller with a fully graphical display.
Here also, we have set new standards in display technology and information content.

Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com

Steca has long stood for ideas and innovations in the area of EMS, solar electronics and battery charging systems.

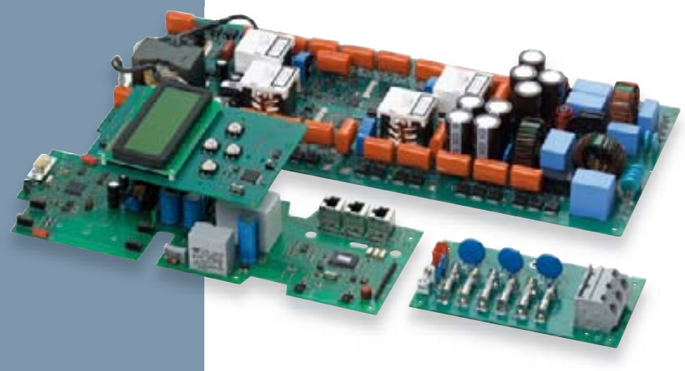
Steca – The EMS provider

Electronic Manufacturing Services

Electronics are with us all day long and every day, improve our quality of life and allow us to feel more secure in nearly everything we do. The technological development of electronics is making more and more applications possible – whether at home or in the car, in medical or information technology, in industry and research or for environmental and solar energy technology.

Over the past years Steca has grown with this market and has achieved the status of a significant Electronic Manufacturing Services (EMS) provider. A high level of expertise in the development of electronic component groups, quality assurance, materials management and logistics, as well as experience in the production of electronics for all areas of life: these are all factors that have helped the company become successful on a global scale.

Electronic components and equipment are today produced in many variations and in virtually every country on the planet. It's a big challenge, even for modern and leading companies, to gain a foothold in this environment. Our response to this is simple: we look to our strengths. Our exceptionally well-trained and highly motivated staff, our years of experience, our well-structured and innovative procedures, sophisticated manufacturing processes and, last but not least, cutting-edge production methods. Consistent quality and a high level of functional reliability at an excellent price-performance ratio are just a couple more of our strengths. All this distinguishes us from the competition and contributes to our success and to that of our customers.



Steca combines electronics and processes in an intelligent and highly-effective way. The outcome is something very normal for Steca: an outstanding result.

Although the everyday tasks carried out at Steca centre around electronics, these are the processes that make an outstanding product possible.

Service around the theme electronics

The sum of many well-planned steps

At the beginning of the development of a product is the product idea. Many different steps and processes have to be worked through before production reaches its final stage. These are influenced by certain factors, namely time, quality and price. The success of a project is determined by sophisticated and well-coordinated processes, combined with expertise, flexibility and experience of a modern service company. Steca has mastered these different steps and processes and guarantees production to deadlines, consistent high quality and an excellent price-performance ratio.

Development
Concept, hardware and software, CAD, certification, documentation, evaluation of components

Trials
Type testing, field test, fatigue test, test laboratory

Material logistics
Materials management, merchandise planning, stock receipt, store management

Production
Automatic fitting (SMD, axial, radial), manual fitting, mechatronics, final installation, varnishing, casting

Testing
Incircuit test, function test, run-in/burn-in test, safety test

Product logistics
Just-in-time delivery, store delivery, vehicle fleet, shipment

After-sales service
Allocation management, product management, analysis and documentation

Steca Elektronik GmbH | 87700 Memmingen | Germany | Fon +49 (0) 8331 8558-0 | Fax +49 (0) 8331 8558-132 | www.stecasolar.com

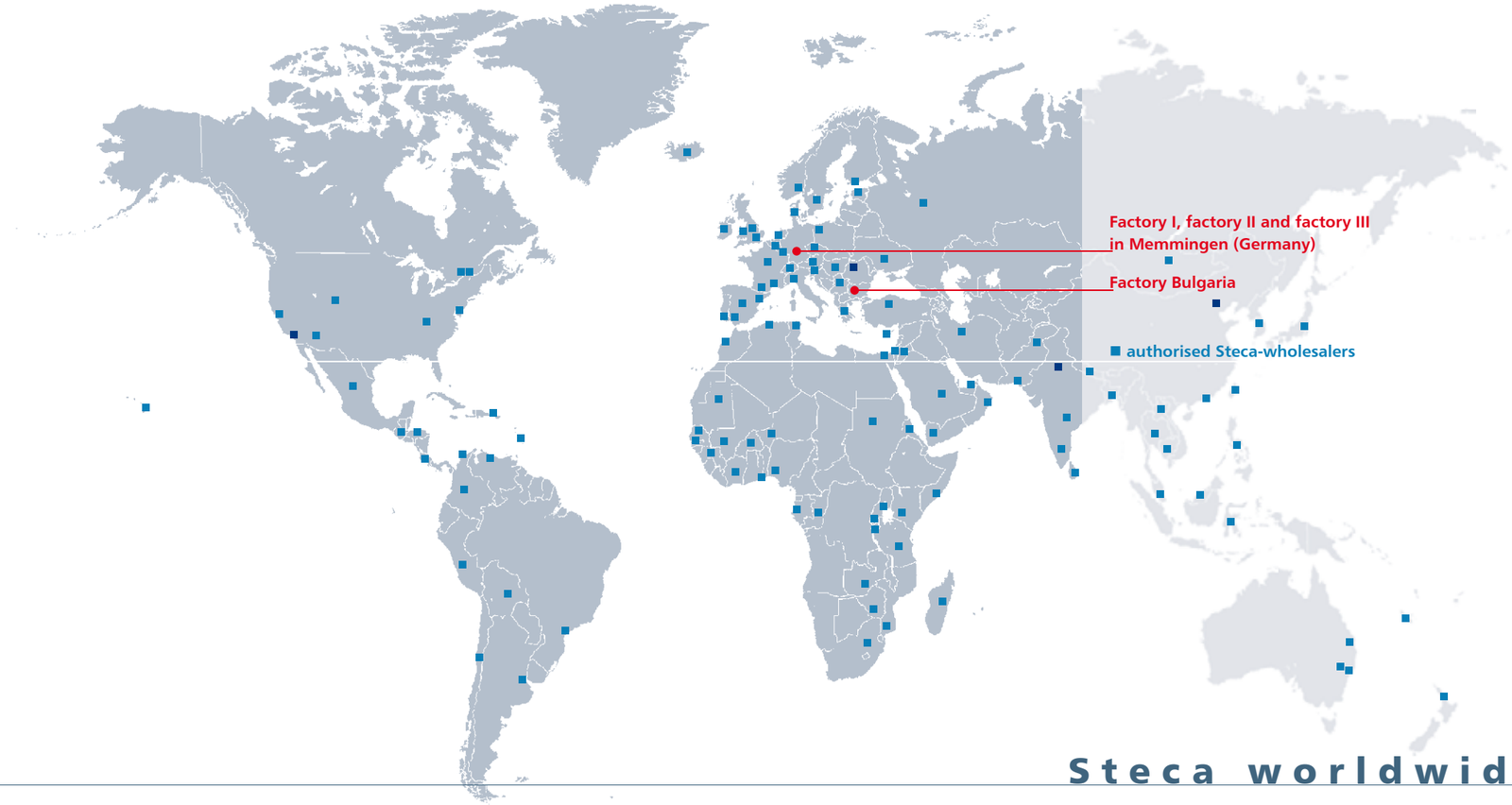
Products for the next Generation

More than 1 Million Steca charge controllers handle over 110 MWp solar power. Worldwide.

The sun is the source of all life on earth. The solar energy that reaches our planet every day produces 2500 times more power than we currently consume. Photovoltaic cells convert the sun's irradiation into clean electricity without greenhouse gas emissions.

Two billion people do not have access to electricity. Steca is committed to improve these people's living conditions by providing quality products with the lowest lifetime cost.

Solutions for the next generation.



Steca worldwide

Regional and international

Steca is one of the leading companies for solar controllers.

Symbols

Photovoltaic-Symbols:

Solar Home System
Espacially designed for applications in solar home systems.

Village Power Supply
Espacially designed for high power applications to electrify rural villages.

Telecom Power Supply
Espacially designed for applications in telecomsector with low noise interferences.

Recreation Vehicles
Espacially designed for RV applications.

Marine Solar Systems
Espacially designed for applications in salty and humid environment.

Prepayment Systems
Espacially designed for applications in rural concession areas.

Remote Monitoring
Transmission of systems data via GSM or analogue telephone link.

Hybrid Systems
Espacially designed for applications with wind, diesel and hydro generators or fuel cells.

Solar Power
Maximum input solar power.

Uninterrupted Power Supply
Inverter can also charge battery from an AC-supply.

SOC
AtonIC© porcessor inside for State Of Charge calculation.

LC-Display
Devices which show the charging procedures via LCD.

Solar thermal Symbols:

Collector array
This controller controls a solar energy system with a collector array.

Collector array on an east/west roof
This controller controls a solar energy system with a collector array on a roof with an east/west orientation.

1 Storage tank
This controller can control a solar energy system with 1 storage tank.

2 Storage tanks
This controller can control a solar energy system with 2 storage tanks.

3 Storage tanks
This controller can control a solar energy system with 3 storage tanks.

4 Storage tanks
This controller can control a solar energy system with 4 storage tanks.

Bypass function
This controller has a bypass function for large collector arrays or systems with large pipe cross-sections.

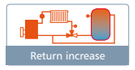
External heat exchanger
This controller controls a solar energy system with an external heat exchanger.

Heat meter
This controller has a built-in heat meter.

Irradiation sensor/switch
This controller uses an extra irradiation sensor as a "threshold switch", or for gathering measurement data.

Back-up heating function
This controller has a thermostatically controlled back-up heating function.

Solid fuel boiler
This controller allows the use of a solid fuel bioler as an extra heat source.



Heating circuit return increase
This controller allows the temperature in the heating circuit return path to be increased.

Hydraulic-Symbols:

Temperature sensor

Pump

Flowmeter

Water tap

3-way-valve

Collector

External heat exchanger

Storage tank

Storage tank with internal heat exchanger

Combined storage tank

Radiator

Back-up-heating Oil/Gas

Solid fuel boiler

www.stecasolar.com

723.529|05-2008
© 2008 by Steca

Steca Elektronik GmbH
Mammostraße 1
87700 Memmingen
Germany

Fon +49 (0) 8331 8558-0
Fax +49 (0) 8331 8558-132